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ABSTRACT

A directory, sponsored by the Council on Undergraduate Research, provides information on research in chemistry at private undergraduate colleges. A department profile and a faculty profile are provided for 93 colleges. The department profile is designed to provide information on the available human resources, facilities, and financial support. The human resources section consists of data on the students, faculty, and staff. Numbers provided on the faculty and support staff are for the fall of 1978, and student data are for the 1978 graduating seniors and for the graduating seniors, 1973-74 through 1977-78. The faculty profile provides data on the education, publications, and research interests of each faculty member. Each faculty member could list up to five papers over the five-year period 1978-78 and when the actual number exceeded this, could provide a notation to that effect. Each individual also listed any research grants active as of the fall of 1978. (SW)

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ED179129

RESEARCH IN CHEMISTRY AT PRIVATE UNDERGRADUATE COLLEGES

A Directory of Work in Progress by the Faculty of 93 Chemistry Departments Along With Background Data on Each Department.

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BRIAN ANDREEN, Editor
January 1979

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COUNCIL ON UNDERGRADUATE RESEARCH

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Minneapolis, MN 55435

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Baccalaureate Origins of Ph.D.'s in Chemistry for Private Predominantly Undergraduate Colleges

FOREWORD

This directory is an outgrowth of an oft expressed wish that information on undergraduate research in progress was broadly available. In the course of frequent interactions with private college faculty who are engaged in research, I have found great interest in what others in similar circumstances are doing. Faculty at the undergraduate private college are typically less mobile than their graduate counterparts. They carry heavier formal teaching loads. Often they are involved in a multitude of extra-curricular campus activities and committee assignments. A number of colleges are geographically isolated and their faculty have only limited funds for off-campus travel. The majority of college researchers never make the "lecture" circuit and have time for only an occasional professional meeting. The result is often an acute lack of awareness about what others are doing, an isolation from the mainstream of research in progress.

Despite this, research in chemistry is alive and thriving at a wide variety of undergraduate private colleges. Most undergraduate researchers spend long hours during the summers making up for lost time on their research. A few manage to maintain active research throughout the year. Some enjoy regular outside support for their research but most manage to maintain productive research involving undergraduates with only occasional injections of scarce and precious college resources. A few have aggressively sought and obtained support from a multiplicity of outside sources. In these cases the result is usually an intensive integration of research and teaching in which the student and professor work side by side in the high adventure of discovery. Students actively participate in the research in almost all the institutions represented in this collection. A legacy of excellent students may, in fact, be one of the strongest assets of the undergraduate teacher-researcher.

Once I made a visit to a little known private college especially to meet a chemist who had a reputation as a master at involving undergraduates in chemical research. In the course of our conversation, it was evident that most of the deterrents to research that exist on most college campuses were present and a few more beside. I inquired why then, if it was so difficult, did he do it? Was it because it enriched their program? Or was it perhaps for the students' sake? After a bit of thought, he replied that basically he did research because he liked to do it. When all the rhetoric is over, perhaps that is, after all, the best answer. Research in the undergraduate colleges requires a high level of dedication. It is as much a matter of spirit and commitment as of NMR's and well stocked laboratories.

Brian Andreen
January 1979

INTRODUCTION

The Council on Undergraduate Research (CUR) was formed in 1978. It is an outgrowth of discussions on how data on research in progress by chemists at private undergraduate colleges could be collected and disseminated. At one time, Professor John S. Sampey of Furman University regularly surveyed the Chemical Abstracts picking out the publications from private liberal arts colleges [J. Chem. Ed., 39, 585 (1962)]. No one has continued this project in recent years. Several valuable research conferences have been held which have assessed the state of undergraduate research (Wooster Conference, 1959, AC_3 Conference, 1967, and Research Corporation Conference, 1975) in the private undergraduate college. None of these conferences, however, provided data on the work in progress on a department by department basis. Accurate up-to-date data on the research activities of undergraduate chemistry departments has simply not been available.

As a response to this need, the CUR decided to sponsor compilation of a directory of departments known to be active in research. Time and resources dictated that the directory be limited to about 100 entries. Selection criteria were used that specified institutional eligibility on the basis of degree offerings, research activity and production of professional chemists. All of the departments selected were predominantly undergraduate in character although several offer master's level work. None offer the Ph.D. Success of the faculty in garnering outside research support and reputation for undergraduate research involvement were factors weighed in applying the research criterion. The major factor used in the productivity criterion was the showing of departments in the baccalaureate origins of Ph.D.'s in chemistry data provided by the National Academy of Sciences. While not a part of the criteria per se, a serious effort was made to include institutions from virtually every region of the country. Also the nature of the departments and the colleges selected shows great variation. Some are well endowed schools with long academic histories while others are relative newcomers that are funded largely from student fees and tuition. There are both traditional private colleges as well as some undergraduate technical colleges represented. A large variant is the department size ranging from two to 17 faculty.

The final list of invitees consisted of 141 institutions and 93 provided an entry. Regrettably, many fine departments could not be included and it should be clearly recognized that this compilation is only a sample. Amherst College, Mount Holyoke College, Smith College and Wake Forest University have been omitted from the directory. All of these departments, while predominantly undergraduate in character, have authorization to offer doctoral degrees and they are listed in the ACS Directory of Graduate Research.

For this compilation, each department was asked to provide a department profile and a faculty profile. The department profile was designed to provide information on the available human resources, facilities and financial support. The human resources consist of data on the students, faculty and staff. Numbers provided on the faculty and support staff were for the fall of 1978. Support staff numbers excluded student assistants and are based on a calendar year full time equivalent (FTE). Student data is for the 1978 graduating seniors and for the graduating seniors, 1973-74 through 1977-78. National student honors list the awards which graduating seniors garnered in open competition such as NSF fellowships, Fullbright fellowships and Rhodes scholarships. The data on facilities, library and equipment refers to the fall of 1978 except for the question on standing orders for review series and annual reviews which covers series continued over the five previous years.

Research-oriented series such as Advances in Organometallic Chemistry, Annual Review of Physical Chemistry, Organic Synthesis are typical of those that could be counted. The figures under support base cover the period September 1977 through August 1978.

The faculty profile provides data on the education, publications and research interests of each faculty member. Each faculty member could list up to five papers over the five-year period 1973-1978 and where the actual number exceeded this, provide a notation to that effect. Publications where a student is a co-author bear an asterisk (*) by the student's name. Book reviews, talks, abstracts and papers that have not been accepted for publication were excluded. Finally, each individual was asked to list any research grants active as of the fall of 1978.

Since this volume is directly printed from an original provided by each department, there is a wide variation in the type and quality of the copy. An effort has been made to eliminate serious deviations from the guidelines in an evenhanded manner and to correct obvious errors. Inevitably some injustices have been done and some abuses have not been corrected and for these, we beg your indulgence.

Many people have made this volume possible. At the busiest time of the academic year, 93 chairmen or chairwomen and their colleagues took time to compile the necessary data and put it in a presentable form. The members of CUR have given freely of their time and advice toward this project. For the baccalaureate origins data we are indebted to Claude Yoder and his colleagues at Franklin & Marshall College. And finally, the project would have been virtually impossible without the generous contribution of Research Corporation through the advice and support of colleagues and by providing the services of the editor and his secretary. We hope that this directory will prove to be a valuable addition to the literature and that future editions can be expanded to include more departments.

COUNCIL ON UNDERGRADUATE RESEARCH

Brian Andreen, Research Corporation
Charles A. Arrington, Jr., Furman University
Michael P. Doyle, Hope College
Heinz F. Koch, Ithaca College
Jerry R. Mohrig, Carleton College
David L. Powell, The College of Wooster
Robert M. Rosenberg, Lawrence University
R. Nelson Smith, Pomona College
James N. Spencer, Lebanon Valley College
Gene G. Wubbels, Grinnell College
Claude H. Yoder, Franklin & Marshall College

ADELPHI UNIVERSITY
Garden City, NY 11530

Fall 1978 ug enrollment 1300
Degrees offered BA - MS
Telephone (516)294-8700 Ext. 7516

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 12 . 2.Support staff: FTE's secretary 3 Stockrm 1 Technician 3
3. 1978 seniors & their placement: Total 14 Grad. school 2 Industry 0 Professional schools 8 Other 4 .
4. Senior majors, average past five years: 12 .
5. Students involved in research, average past five years: Acad. yr. 77 Summer 0
6. National student honors, past five years (NSF fellowships, etc.)

None.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 ~22,000 % used for teaching 54% Research 46%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)
    1. Syntex Corp-X-ray diffractometer
    2. Perkin-Elmer-R 12 B NMR
    3. Cary 14-Spectrophotometer
    4. IR 7-Spectrophotometer
    5. F&M 810-Chromatograph
    6. F&M 726 Chromatograph
    7. NPHA magnetic susceptibility
    8. Perkin-Elmer 204A-Fluorescent spectrophotometer
    9. Perkin-Elmer 306-Atomic absorption spectrophotometer
    10. Perkin-Elmer 403-Atomic absorption spectrophotometer
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 100 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 40. .
4. Computer facilities: Two Decwriter terminals, one acoustically coupled. Both connected to 680 Burroughs.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: None.
2. Departmental grants (list Dreyfus, du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None.
3. Faculty teaching loads: Contact hours 21 Load credit for research? no
4. Sabbatical or leave support for research: One-half salary for full year and full salary for one-half year. Frequency every seven years.

FACULTY PROFILE

ADELPHI UNIVERSITY

BETTELHEIM, FREDERICK A.(b. 1923) Professor. B.S., 1946, Cornell University. Ph.D, 1956, University of California. Physical Chemistry. Physical Chemistry of glycoproteins, lens proteins and proteoglycans. Light scattering, optico-mechanical properties of tissues such as cornea, lens and the vitreous of the eye. Aging process in the skin and the role of proteoglycans.
F. A. Bettelheim and A.A.A. Bettelheim, Small angle light scattering studies on xylose cataract formation in bovine lenses. Invest. Ophthalmol. Visual Sci. 17, 896-904 (1978).
M.. Loewenstein and F.A. Bettelheim. Calcium binding to glycosaminoglycans and corneal proteoglycans. Carbohydr. Res. In print.
F.A. Bettelheim and M. Paunovic. Light scattering of normal human lens I. Application of random density and orientation fluctuation theory. Biophys. J. In print.

Grants Active, 1977-78; National Eye Institute, $26,860, Light Scattering Parameters of Cataractous Lenses, 1978-79; National Eye Institute, $16,249, Studies of Induced Cataracts in Fish Lenses, 1978-79; National Institute of Aging, $17,300, The Role of Proteoglycans in Aging Tissues, 1978-79.

DAVIS, DONALD G. (b. 1939) Assistant Professor. B.A. 1961, University of Lehigh, Ph.D. 1966, Carnegie Institute of Technology. Biochemistry. The structure function relationships in biological molecules.
B.F. Gisin, S. Kobayashi, D. G. Davis and J. E. Hall. Synthesis of Biologically Active Alamethicin. Reprint from Peptides. Proceedings of the Fifth American Peptide Symposium 1977.
B.F. Gisin, H.P. Ting-Beall, D.G. Davis, E.Grell and D.C. Tosteson. Selective ion Binding and Membrane Activity of Aynthetic Cyclopeptides. Biochimica et Biophysica Acta, 509, (1978) 201-217.
Grants
Conformation and Function of Cyclic Peptides.
$13,546-National Institute of Agent General Medical Sciences GM 24267.

GOLDBERG, STEPHEN Z. (b. 1947) Assistant Professor. B. S. Cornell University, Ph.D. 1973, University of California, Berkeley. Inorganic Chemistry. Crystallography, structures of inorganic and organic molecules, chemistry and structure of hyporitrites, computers in chemical education.
S. Z. Goldberg. Equbal-A Computer program for Balancing Chemical Equations, J. Chem. Ed. 55, 5532 (1978).

HALLIDAY, ROBERT W. (b. 1942) Associate Professor. B. S. 1964, Bates College, Ph.D. 1969, Wayne State University. Inorganic Chemistry. Preparation of inorganic Compounds; Optically active compounds; compounds of the linear tetraamines. Properties of coordination compounds; magneto chemistry of Ni^{+2} complexes; UV-Vis and I.R. Spectoscopy; optical rotatory dispersion and circular dishroism. Pfeiffer effect in inorganic coordination complexes.

LANDESBERG, JOSEPH M. (b.1939). Professor. B.S. 1960, Rutgers University. Ph.D. 1964, Harvard University. Organic Chemistry. Application of transition metal complexes to organic synthesis. Preparation of novel transition metal complexes. Synthesis of strained, small membered rings. Rearrangements of strained systems. New synthesis of heterocycles. Acidity of heterocycles. Photochemistry of heterocycles. Acetylene chemistry.
The Organic Chemistry of Iron, "Stabilizing of unstable species with carbonyliron," Vol. 1, Academic Press, N. Y. (1978).
Grants Adelphi Research Council, January 1978.

MARCH, JERRY. (b. 1929). Professor. B.S. 1951, City College of N.Y., Ph.D.1957, Pennsylvania. Organic Chemistry. Stability of carbanions; Organic synthesis Visited Imperial College in London and worked with Prof. Barton in lab.

MOON, SUNG. (b. 1928) Professor. B.S. 1956, University of Illinois, Ph.D. 1959, Massachusetts Institute of Technology. Organic Chemistry. Synthesis of novel organic compounds. Synthesis of potentially biologically-active compounds. Sterochemistry and reaction mechanisms. Reactions of metal acetates.

OPALECKY, DONALD T. (b. 1928). Associate Professor. B.S. 1951, Clarkson College of Technology, Ph.D. 1965, Adelphi University. Chemical Instrumentation. Design of a digital spectrophotometer. Design of microwave spectrophotometer. Design of a digital instrument for the measurement of dielectric constant. Differential polarography applies to organic species. Square wave polarography applies to organic species.

RUDMAN, REUBEN. (b. 1937) Professor. B.A. 1957, Yeshiva University, Ph.D. 1966, Polytechnic Institute of Brooklyn, Inorganic Chemistry. X-Ray Diffraction, Differential Scanning Calorimetry, Crystal Structure Analysis, Molecular Complexes, Solid-Solid phase transitions, Low-temperature X-Ray Diffraction Techniques.
Science 200, 531 (1978)-R. Reudmah, D. Eilerman. S. J. LaPlace, Structure of Crystalline Tris.
J. Appl. Cryst. 10, 209 (1977), R. Rudman. Pryor Description of Low Temperature Apparatus.
American Laboratory, July 1977, R. Rudman. Gas Stream Method of Cooling in X-ray Diffraction.
ol. Cryst. Liq. Cryst. 41, 97 (1977), R. Rudman, R. Powers. Polymorphism in Ordered Carbon Tetrabromide.
J. Chem. Infor. and Comp. Sci. 17, 208 (1977). R. Rudman. A coded Data Bank for Chemical Instrumentation.
J. Appl. Cryst. 11, 65 (1978). R. Rudman. Index of Crystallographic Supplies, Supplement.
Grant
NSF $36,000.

SISTI, ANTHONY. (b. 1928) Professor. B.S. 1950, City College of N.Y., Ph.D. 1959, University of Michigan. Organic Chemistry. Ring enlargements. Displacement reactions and London force therein.

TODD, MADELYN. (b 1922) Assistant Professor. B. S. 1942 University of Pittsburgh. Theoretical Chemistry.

WINDWER, STANLEY. (b. 1930) Professor, Chairman. M.S., Ph.D. 1962, New York University. Physical Chemistry and Theoretical Chemistry. Experimental: Electrical conductivity-low, medium and high dielectric constant studies. Theoretical: Statistical mechanics of phase transitions; statistical mechanics of polymers; conformational studies of protein structure.

AGNES SCOTT COLLEGE

Decatur, GA 30030

Fall 1978 ug enrollment 557

Degrees offered B.A.

Telephone (404) 373-2571 Ext. 229

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 0 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 3 Grad. school 1 Industry 1 Professional schools 0 Other 1 .
4. Senior majors, average past five years: 2.8 .
5. Students involved in research, average past five years: Acad. yr. 1.6 Summer 1.6
6. National student honors, past five years (NSF fellowships, etc.)
   None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 15,326 % used for teaching 60 Research 23
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   Spectrophotometer (Pye-Unicam SP1800, Beckman 25 and Beckman DU)
   Spectrophotofluorometer (Aminco-Bowman)
   NMR (P-E R24A)
   IR (Pye-Unicam SP1100 and P-E137B)
   Potentiostats (Wenking 61RH and custom made for RRDE)
   AA (Varian 1000)
   HPLC (Waters ALC/GPC-201)
   FID-GC (Varian 274010-00, TC H/P F&M, 2 Carle)
   Electrometer/C-14 (Nuc. Chicago Dynacon 6000)
   Asst. Radiochemical (Nuc. Chicago)

3. Library resources: Chem. abstracts? Thru 1977 Volume indices? Yes Collected indices? Some Total journal subscriptions? 24 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 12 .
4. Computer facilities: Department: 2 PDP/8s minicomputers, 2 ASR-33TTY, 1 HSR, 1 Tennecomp Mag Cartridge Unit, 1 AX08 Data Acquisition Unit (Scope Display); Campus: Terminals to Emory University Univac 90/80.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approximately $1000/yr. for expendable supplies; Travel: 1 meeting per year per faculty member.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   NSF-URP (joint with Georgia State University) $14,400
3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research: Two Quarters or Full Year at 50% salary; one Quarter at Full salary. Eligible for one sabbatical leave an average of every six years of full-time teaching with at least four years separating any two sabbatical leaves. Exceptions considered on individual basis.

FACULTY PROFILE*

BOYKIN, DAVID W., Jr. (b. 1939) Visiting Professor (Fall 1978). B.S. 1961, University of Alabama, M.S. 1963, University of Virginia, Ph.D. 1965, University of Virginia. Organic Chemistry.

CUNNINGHAM, ALICE J. (b. 1937) Associate Professor and Chairman. B.A. 1959, University of Arkansas, Ph.D. 1966, Emory University. Analytical and Physical Chemistry. Electroanalytical methods and biochemical analysis.

FOX, MARY W. (b. 1914) Instructor. B.A. 1939, Agnes Scott College. General Chemistry.

GARY, JULIA T. (b. 1929) Professor and Dean of Faculty. B.A. 1951, Randolph-Macon Woman's College, M.A. 1953, Mount Holyoke College, Ph.D. 1958, Emory University. Analytical and General Chemistry.

GILBERSON, DAVID L. (b. 1951) Lecturer (Fall 1978). B.S. 1973, Bluefield State College, Ph.D. candidate, University of Georgia. Organic Chemistry.

WHITE, ALAN J. (b. 1948) Assistant Professor. B.S. 1970, University of Vermont, Ph.D. 1974, Massachusetts Institute of Technology. Inorganic and General Chemistry. Structure-Reactivity Relationships of Transition Metal Phosphorous Complexes, Synthesis of Organo Metallic Cluster Cpds. Seven publications 1973-78:

F.A. Cotton, B.E. Hanson, J.K. Kolb, P. Lahuerta, G.G. Stanley, B. Ray Stults, and A.J. White, The Carbonyl Scrambling Processes in the Isomeric Pentacarbonylguaiazulenediiron and Homologous Ruthenium Molecules; A Novel Mechanism for the Internuclear Processes, J. Amer. Chem. Soc., 99, 3673 (1977).
F.A. Cotton, D.L. Hunter, P. Lahuerta, and A.J. White, Structural and Dynamical Properties of Dicyclopentadienyltetracarbonyldiiron Derivatives with Linked Rings, Inorg. Chem., 15, 557 (1976)
F.A. Cotton, D.L. Hunter, and A.J. White, The Effect of tris-(2,4 pentanedionato) chromium (III) on Carbon-13 Linewidths: Potential Dangers in Lineshape Analysis, Inorg. Chem., 14, 703, (1975).
F.A. Cotton, B.A. Frenz and A.J. White, The Crystal and Molecular Structures of Cis-bis(pentahaptocyclopentadienyl)tricarbonyl(triphenyl-phosphite)diiron, Inorg. Chem., 13, 1407 (1974).
F.A. Cotton, L.U. Kryczynski, and A.J. White, Spectroscopic Studies of the Structural and Dynamical Properties of Bis(pentahapto-cyclopentadienyl) tricarbonyl(triphenylphosphite)diiron in Solution, Inorg. Chem., 13, 1402 (1974).

Grant active, 1978-1980: Research Corporation Cottrell College Science Grant, $9,200.

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*CLARK, MARION T., Professor and Chairman (deceased, Sept. 9, 1978).

AUGUSTANA COLLEGE
Rock Island, IL 61201

Fall 1978 ug enrollment 2100
Degrees offered B.A.
Telephone 309-794-7000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 3/4 Stockrm 3/4 Technician 0
3. 1978 seniors & their placement: Total 12 Grad. school 6 Industry 2 Professional schools 1 Other 3 .
4. Senior majors, average past five years: 11 .
5. Students involved in research, average past five years: Acad. yr. 2 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 11,646 % used for teaching 90% Research 10%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - Varian EM 360
IR - PE 467
UV - Vis Varian 635
GC Varian 2760
Centrifuge - IEC B20A
Gel Electrophoresis - ISCO 1270

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? some Total journal subscriptions? 25 Computer literature search service? Oct. '79 Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) no records kept.
4. Computer facilities: Department; DEC writer, DEC scope to PDP 11/70. Campus; PDP 11/70 and Iowa City Regional Computer Center.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $5600/yr. chemicals and glassware; $4000/yr. for equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Title VI matching grant $12,000 total
3. Faculty teaching loads: Contact hours ab. 13 Load credit for research? exception
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at full salary for one quarter, three fourths of annual salary for two quarters, one-half of annual salary for one year. Frequency averages every 7th year.

FACULTY PROFILE

BERNTSEN, ROBERT A. (b. 1917) Professor and Chairman. B.A., 1939, St. Olaf College, M.S., 1941, New York University, Ph.D., 1949, Purdue University. Organic Chemistry.

DE WIT, DAVID G. (b. 1944) Assistant Professor. B.S., 1966, Calvin College, Ph.D., 1970, Northwestern University. Physical-Inorganic Chemistry. Kinetics and mechanisms of reactions of transition metal complexes.

D.G. DeWit, J.P. Fawcett, and A. Poe, Reaction Mechanisms of Metal-Metal Bonded Carbonyls. Part XI. Reactions of Nonacarbonyl (triphenylphosphine) dirhenium and Octacarbonylbis (triphenylphosphine) dirhenium, J. Chem. Soc., Dalton, 528-33 (1976).

ELIASON, MORTON A. (b. 1932) Professor. B.A., 1954, Concordia College, Ph.D., 1959, University of Wisconsin. Physical Chemistry. Theoretical chemistry, quantum theory, statistical mechanics, kinetics, physical properties.

Anna M. Wartman, *Caroline Hagberg, and Morton A. Eliason, Refractive Index-Dry Substance Relationships for Commercial Corn Syrups, J. Chem. & Eng. Data, 21(4)459 (1976).

PETERSON, MELBERT E. (b. 1930) Professor. A.B., 1953, Augustana College, M.S., 1955, University of Illinois, Ph.D., 1967, Oklahoma State University, 1973, Associate Director, Augustana Research Foundation. Organic Chemistry. Grignard reaction, organophosphorus chemistry, elimination reactions.

STOEL, LLOYD J. (b. 1946) Assistant Professor. B.A., 1968, Gustavus Adolphus College, Ph.D., 1974, University of Iowa. Analytical Chemistry. Metal ion interactions with tetracyclines.

G.A. Asleson, L.J. Stoel, E.C. Newman, and C.W. Frank, Nuclear Magnetic Resonance Spectra of Tetracyclines: The Assignment of Additional Protons, J. Pharm. Sci. 63, 1144 (1974).

L. J. Stoel, E.C. Newman, G.A. Asleson, and C.W. Frank, Preparation, Isolation, and Identification of 4-Dedimethylamino-11-methoxyanhydrotetracycline, J. Pharm. Sci. 64, 1635 (1975).

L.J. Stoel, E.C. Newman, G.A. Asleson, and C.W. Frank, Potentiometric and Spectral Investigations of Anhydrotetracycline and Its Metal Ion Complexes, J. Pharm. Sci. 65, 1794 (1976).

WARTMAN, ANNA M. (b. 1938) Associate Professor. B.S., 1960, University of Detroit, Ph.D., 1966, Wayne State University. Biochemistry. Chelation effects of EDTA on collagen and elastin turnover in hypercholesterolemic rabbits.

Anna M. Wartman, William E. Connor, The Cholesterol balance and turnover in genetically hypercholesterolemic pigeons: their response to treatment with a hypocholesterolemic drug, cholestane 3 5 6 triol, J. Lab. & Clin. Med. 82(5), 793-808 (1973).

Anna M. Wartman, *Caroline Hagberg, and Morton A. Eliason, Refractive index-dry substance relationships for commercial corn syrups, J. Chem. & Eng. Data 21(4) 459 (1976).

AUSTIN COLLEGE

Sherman, TX 75090

Fall 1978 ug enrollment 1190

Degrees offered B.A.

Telephone (214) 892-9101

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 3/4 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 11 Grad. school 2 Industry 1 Professional schools 8 Other ________.
4. Senior majors, average past five years: 11 .
5. Students involved in research, average past five years: Acad. yr. 7 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR-Varian EM360
MS-Hitachi RMU-6D
UV-Vis - Coleman EPS-3T, Beckman DB
Mossbauer-Austin Assoc.
IR-Beckman Ir-V
X-Ray Diffraction Unit
GC-Varian Aerograph
TGA-Cahn
DTA-Premco

3. Library resources: Chem. abstracts? yes Volume indices? no Collected indices? yes Total journal subscriptions? 21 Computer literature search service? yes Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 15 .
4. Computer facilities: Campus: Interdata 732 Computer

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $30,000/yr. chemical, glassware, equipment, scholarships
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 12 Load credit for research? 3 hours
4. Sabbatical or leave support for research:
Faculty can apply for sabbatical leave at 50% salary full year, full salary for ½ year. Frequency: every 7th year.

FACULTY PROFILE

BARR, CHARLES R. (b. 1932) Professor. B.A., 1954, North Central College. M.S., 1957, Ph.D., 1960, Michigan State University. Biochemistry. Reactive sites in enzymes.

BARNES, JAMES A. (b. 1944) Assistant Professor. B.S., 1966, Davidson College. Ph.D., 1970, University of North Carolina. Inorganic and Analytical Chemistry. Synthesis and characterization of transition metal complexes, especially compounds with possible anti-tumor properties. Energy production and conservation.

K. T. McGregor, J. A. Barnes, and W. E. Hatfield, "Magnetic Studies of Substituted Pyridine N-Oxide Complexes of Copper (II) Nitrate," J. Amer. Chem. Soc., 95, 7993 (1973).

K. T. McGregor, J. A. Barnes, and W. E. Hatfield, "Influence of Ring Substituents on the Ground State in Dimeric Di-μ-(R-Pyridine N-Oxide)Bis[Bisnitrato(R-Pyridine N-Oxide)-Copper (II)] Complexes," J. Molecular Structure, 20, 182 (1974).

J. D. Odom, J. A. Barnes, B. A. Hudgens, and J. R. Durig, "Spectra and Structure of Boron-Nitrogen Compounds. II. Infrared and Raman Spectra of Trimethylamineborane," J. Phys. Chem., 78, 1503 (1974).

GIBSON, HARRY H., JR. (b. 1939). Professor. B.A., 1961, Emory University. Ph.D., 1967, Florida State University. Organic Chemistry. Chemistry of carbenes and nitrenes.

H. H. Gibson, Jr., *H. R. Gaddy, III, and *C. S. Blankenship, "Reaction of Organic Azides with Ethoxycarbonylnitrene," J. Org. Chem., 42, 2443 (1977).

H. H. Gibson, Jr., *C. H. Bundy and *H. R. Gaddy, III, "The Interaction of n-Hexyl Azide and Carbethoxynitrene," Tetr. Letts., 1973, 3801.

Grant Active 1977-78: The Robert A. Welch Foundation Grant, $14,000. The Interaction of Organic Azide and Reactive Intermediates.

IMHOFF, MICHAEL A. (b. 1942) Associate Professor and Chairman. B.A., 1964, University of California at Riverside. Ph.D., 1969, University of Colorado. Organic Chemistry. Free radical displacements on carbon and neighboring group participation in solvolytic reactions.

L. R. Subramanian, M. Hanack, L. W. K. Chang, M. A. Imhoff, P.v.R. Schleyer, F. Effenbeauer, W. Kurtz, P. Stang, and T. Dueber, "On Attempts at Solvolytic Generation of Aryl Cations," J. Org. Chem., 41, 4099 (1976).

T. W. Bentley, S. H. Liggero, M. A. Imhoff and P.v.R. Schleyer, "Evidence against appreciable hidden return in solvolysis of simple secondary substrate," J. Amer. Chem. Soc., 96, 1970 (1974).

Grant Active, 1977-78: The Robert A. Welch Foundation Grant, $14,000. Free Radical Displacement on Carbon.

MACKEY, J. LINN (b. 1934) Professor. B.S., 1956, Southeast Missouri State College. Ph.D., 1960, Iowa State University. Physical Chemistry. Mössbauer Effect in Rare-Earth Chelates.

BARNARD COLLEGE

New York, NY 10027

Fall 1978 ug enrollment 2200

Degrees offered B.A.

Telephone (212) 280-3377 or
280-2074

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2.Support staff: FTE's secretary 1½ Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 22 Grad. school 6 Industry 2
Professional schools 8 Other 6 .
4. Senior majors, average past five years: 16 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)
Lando Summer Research Fellow, Univ. of Minnesota, 1974 & 1975
NSF Predoctoral Fellow 1975-76
A. Steyermark Scholarship ($500) from American Microchemical Society, 1978

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 18,000 % used for teaching 90% Research 10%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR (Varian T-60)
IR (Perkin-Elmer 467)
(two P-E 710A)
UV-Vis (Beckman DB-G)
(Perkin-Elmer 200)
(Gilford modified Beckman DU)
GC (Varian 1200 with Linear Inst. 252A integrating recorder)
(Aerograph A-90-P)
(Gow-Mac 69-150)
Polarograph (Heath,recording)
Conductivity Bridge (Indus. Instr. RC-18)

3. Library resources:*Chem. abstracts? yes Volume indices? yes Collected indices? no
Total journal subscriptions? 14 Computer literature search service? no
Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 9 .
* We also have full use of the Columbia University Libraries.
4. Computer facilities:
Campus IBM 360/91 combined with 360/75

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Individual faculty members apply to an all college, faculty administered Research and Travel Fund for their needs. Usually granted up to $1000 each. All requests granted '77-'78.
2. Departmental grants ([illegible] Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
Celanese Corp. $3000
3. Faculty teaching loads: Contact hours 9-10 Load credit for research? no
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary for a full year, or full salary for 1/2 year. Normally given automatically every 7th year. Special leaves are also possible.

FACULTY PROFILE

CHAPMAN, SALLY

(b. 1946) Assistant Professor. A.B. 1968, Smith College; Ph.D. 1973, Yale University. Physical Chemistry. Theoretical kinetics; molecular collision processes. Thirteen publications, 1974-78.

H. Schor, S. Chapman, S. Green and R.N. Zare, "Theoretical Study of Collinear Be + FH → BeF(V_2) + H," J. Chem. Phys. (to be published).

F. Schnabel* and S. Chapman, "Reactive Bands and Rebounding Trajectories in Collinear F + H_2" Chem. Phys. Lett., 57, 189 (1978).

S. Green and S. Chapman, "Collisional Excitation of Interstellar Molecules: Linear Molecules CO, CS, OCS and HC_3N" Astrophysical Journal Supplement Series, 37, 169 (1978).

S. Chapman and S. Green, "Rotational Excitation of Linear Molecules by Collisions with Atoms: Comparison of Classical and Quantum Methods" J. Chem. Phys., 57, 2317 (1977).

S. Chapman, B.C. Garrett and W.H. Miller, "Semiclassical Eigen-values for Nonseparable Systems: Nonperturbative Solution of the Hamilton-Jacobi Equation in Action Angle Variables," J. Chem. Phys., 64, 502 (1976).

Current Grants: Alfred P. Sloan Research Fellow, 1978-1980. $19,800.
ACS-PRF Type G Grant, 1976-1979. $9,000.

JACOBSON, BARRY M.

(b. 1945) Assistant Professor. B.S. 1965, University of Chicago; Ph.D. 1971, Harvard University. Organic Chemistry. Mechanisms of ene and retro-ene reactions and of cycloadditions. Six publications, 1973-1978.

N.J. Turro, K-C. Liu and B.M. Jacobson, "Photoelimination of Nitrogen from Reluctant Cyclic Azo Compounds. Preparation of some Novel Cyclopentadiene Cyclodimers," Tetrahedron Letters, 555 (1978).

B.M. Jacobson, A.C. Feldstein* and J.I. Smallwood*, "Ene Reactions of Conjugated Dienes. Rate Enhancements in Cyclic 1,3-Dienes and Dependence of Ene Adduct: Diels Alder Adduct Ratio on Enophile Structure," J. Org. Chem., 42, 2849 (1977).

R.V. Stevens, W.E. Billups and B. Jacobson, "Stereochemistry and Reaction Mechanism" in Techniques of Chemistry, Vol. VI, Part I, E.S. Lewis, Ed., Wiley-Interscience, N.Y. (1974).

B.M. Jacobson, "Effects of Neighboring Non-conjugated Double Bonds in the Diels-Alder Reaction," J. Am. Chem. Soc., 95, 2579 (1973).

B.M. Jacobson and P.D. Bartlett, "Competing Mechanisms in the Reactions of Cyclopentadiene with Trifluoroethylene and 2-Chloro-1,1-di-fluoroethylene," J. Org. Chem., 38, 1030 (1973).

KING, GRACE W.

(b. 1923) Lecturer. B.A. 1945, University of Maine; Ph.D. 1950, Yale University. Physical Organic Chemistry. Ionization constants of amino acids.

8

LESSINGER, LESLIE

(b. 1943) Assistant Professor. B.A. 1964, Harvard College; M.A. 1965, Harvard University; Ph.D. 1971, Harvard University. Physical Chemistry. X-ray Crystallography; application of direct methods to the solution of structures of natural products and other compounds of biological interest; structural chemistry of organic polyvalent iodine compounds. Eighteen publications, 1973-78.

V. Langer, K. Huml and L. Lessinger, "The Crystal and Molecular Structure of Adeninium Hemisulfate Hydrate, $C_5H_5\cdot\frac{1}{2}H_2SO_4\cdot H_2O$," Acta Cryst., B34, 2229 (1978)

A.W. Dunn, R.A. Johnstone, B. Sklarz, L. Lessinger and T.J. King, "Andilesin, a C_{25} Polyisoprenoid from *Aspergillus sp*. X-ray Crystallographic and Spectroscopic Determination of the Structure," J. Chem. Soc. Chem. Commun., 533 (1978).

T.N. Margulis and L. Lessinger, "N-Acetylcolchinol. Structure and Hydrogen-Bonding in a Benzenoid Colchicine Analogue," Biochem. and Biophys. Res. Comm., 83, 472 (1978).

L. Lessinger and T.N. Margulis, "The Crystal Structure of Isocolchicine, an Inactive Isomer of the Mitotic Spindle Inhibitor Colchicine," Acta Cryst., B34, 1556 (1978).

L. Lessinger and T.N. Margulis, "The Crystal Structure of Colchicine. A New Application of Magic Integers to Multiple-Solution Direct Methods," Acta Cryst., B34, 578 (1978).

SEGAL, BERNICE G.

(b. 1929) Professor and Chairman, B.A. 1950, Radcliffe College; M.A. 1952, Columbia University; Ph.D. 1955, Columbia University. Physical and Inorganic Chemistry. Magnetic properties of matter; structures of paramagnetic inorganic complexes.

B.G. Segal and S.J. Lippard, "Transition Metal Hydroborate Complexes. 10. The Crystal and Molecular Structure of Tris (tetrahydroborato)tris(tetrahydrofuran) yttrium(III)," Inorg. Chem., 17, 844 (1978).

B.G. Segal and S.J. Lippard, "Transition Metal Hydroborate Complexes. 9.Preparation, Properties and Structure of Di-μ-cyanotrihydroborato-bis(2,2',2"-triaminotriethylamine)dinickel(II)Tetraphenylborate," Inorg. Chem., 16, 1623 (1977).

B.G. Segal and S.J. Lippard, "Transition Metal Hydroborate Complexes. VII. Preparation.Properties and Structure of Bis(cyanotrihydroborato)-1,1,4,7,7-pentamethyldiethylenetriamine copper(II), Inorg. Chem., 13, 822 (1974).

BATES COLLEGE

Lewiston, ME 04240

Fall 1978 ug enrollment 1458

Degrees offered BA and BS

Telephone (207) 784-4141

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 0 Stockrm 3/4 Technician 0
3. 1978 seniors & their placement: Total 19 Grad. school 5 Industry 4 Professional schools 4 Other 6 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 7 Summer 3*
6. National student honors, past five years (NSF fellowships, etc.)

None

*Summer of 1978 only - first year of summer research program

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 28,200 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

UV-Vis (Coleman 124)
NMR (Hitachi R-24A)
IR (Perkin-Elmer 700A)
IR (Perkin-Elmer Infracord)
2-GC (Aerograph A-90-P)
UV-Vis (Beckman DU)
pH-mV Meter (Orion 701A)
AA (Jarrell-ASH Dial-Atom)
Polarograph (PAR-174A)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 44 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 25 .
4. Computer facilities: 6 access ports to Dartmouth Time Sharing System

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $13,000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None
3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research:

Sabbatical leave at 50% salary full year or full salary for half year, every 7th yr. Short Term (six weeks) leave at full salary, every 4th year.

BOYLES, JAMES G. (b. 1937) Associate Professor and Chairman. B. S., 1959, Pennsylvania State University, Ph.D., 1966, Rutgers University, Physical Chemistry. Determination of charge-transfer complex equilibrium constants by NMR techniques. Analytical chemistry of pesticides and herbicides. Computer use in chemical education.

Boyles, J. G., & D. S. Page, "The Chemistry and Qualitative Analysis of Cations," three modules for the Modular Laboratory Program in Chemistry, Willard Grant Press, 1973.

Boyles, J. G., & D. S. Page, "The Chemistry and Qualitative Analysis of Anions," one module for the Modular Laboratory Program in Chemistry, Willard Grant Press, 1973.

Boyles, J. G., Wait, R., Morrison, R., Bates, S.*, Weir, D.*, Newton, A.*, & J. Gross*, Water Quality Study of Lakes in the Lewiston Area, privately printed technical report, 1973, funded in part by Title I of the Higher Education Act.

Boyles, J. G., Sprowles, J., Curtis, V., & D. Nygaard, "Experimental Chemistry" (an integrated general chemistry/organic chemistry laboratory manual), Bates College, 1976.

CURTIS, VIRGINIA A. (b. 1948) Assistant Professor. B.A., 1970, Occidental College, Ph.D., 1974, Indiana University, Biochemistry. Photosynthesis, analysis of photosynthetic mutants of Chlamydomonas reinhardi.

J. N. Siedow, V. A. Curtis, and A. San Pietro, Studies on Photosystem I. I. Relationship of Plastocyanin, Cytochrome f, and P700, Arch. Biochem. Biophys., 158, 889 (1973).

V. A. Curtis, J. N. Siedow, and A. San Pietro, Studies on Photosystem I. II. Involvement of Ferredoxin in Cyclic Electron Flow, Arch. Biochem. Biophys., 158, 898 (1973).

V. A. Curtis, J. J. Brand, and R. K. Togasaki, Partial Reactions of Photosynthesis in Briefly Sonicated Chlamydomonas I. Cell Breakage and Electron Transport Activities, Plant Physiol., 55, 183 (1975).

J. J. Brand, V. A. Curtis, R. K. Togasaki, and A. San Pietro, Partial Reactions of Photosynthesis in Briefly Sonicated Chlamydomonas II. Photophosphorylation Activities, Plant Physiol., 55, 187 (1975).

LEDLIE, DAVID B. (b. 1940) Assistant Professor. B.S., 1962, Middlebury College, Ph.D., 1966, MIT, Organic Chemistry. Cyclopropyl and Perpendicular Ally Cations. Seven publications 1973-1978.

D. B. Ledlie, *W. Barber, & **F. Switzer, On the Conformation of the Cyclopropyl Cation, Tetrahedron Lett., 607 (1977).

D. B. Ledlie, *M. Costopolus, & G. Olah, The First Stable Cyclopropyl Cation, J. Am. Chem. Soc., 99, 4196 (1977).

D. B. Ledlie, *T. Swan, *J. Pile and *L. Bowers, Halocyclopropanes, J. Org. Chem., 41, 419 (1976).

D. B. Ledlie & *L. Bowers, 1,6-Methano/10/annulene, J. Org. Chem., 40, 792 (1975).

D. B. Ledlie, J. Knetzer, & *A. Gitterman, The Chemistry of some Tricyclic Cyclopropyl Halides, J. Org. Chem., 39, 708 (1974).

Grants active 1977-78: Research Corporation Cottrell College Science Grant, $4,000, Synthesis of a Perpendicular Allyl Cation; Petroleum Research Fund Type B Grant, $13,000, Cyclopropyl Cations.

*Undergraduate students **High School project catalyst fellow

FACULTY PROFILE (Cont.)

NYGAARD, DANTON D. (b. 1946) Assistant Professor. B.A., 1968, University of Wisconsin, Ph.D., 1972, Massachusetts Institute of Technology, *Analytical Chemistry*. Analysis of trace metals in natural waters. Analysis of trace toxic gases in the atmosphere.

SPROWLES, JOLYON C. (b. 1944) Assistant Professor. A.B., 1966, Princeton University, Ph.D., 1973, Cornell University, *Physical Inorganic Chemistry*; *Vibrational Spectroscopy*. Complexes of very weak bases, spectra and structure of organometallic cations and polymers.

S. Mansy, T. E. Wood*, J. C. Sprowles, R. S. Tobias, Heavy Metal-Nucleotide Interactions. Binding of Methylmercury (II) to Pyrimidine Nucleosides and Nucleotides. Studies by Raman Difference Spectroscopy, *J. Am. Chem. Soc.*, *96*, 1762, (1974).

J. W. Amy, R. W. Chrisman, J. W. Lundeen, T. Y. Ridley, J. C. Sprowles, and R. S. Tobias, A Programmed Cell Instrument for Raman Difference Spectroscopy, *Appl. Spectroscopy*, *28*, 262, (1974).

J. C. Sprowles and R. A. Plane, Raman Spectrophotometric Study of Aqueous Chlorate Solutions, *J. Phys. Chem.*, *79*, 1711, (1975).

WYLIE, PHILIP L. (b. 1949) Assistant Professor. B.A., 1971, Grinnel College, Ph.D., 1976, University of California, Davis, *Mechanistic and Synthetic Organic Photochemistry*. Photochemistry of sulfones; synthesis of small and medium-sized cyclophanes; photochemistry of β,γ-unsaturated ketones and β,γ-epoxy ketones.

R. S. Givens and P. L. Wylie, Photoextrusion Reactions: SO_2 Extrusion as a Route to Cyclophanes, *Tetrahedron Lett.*, 865 (1978).

K. G. Hancock and P. L. Wylie, The Photochemistry of 3-Ethoxy-3-methylpent-4-en-2-one, an α-Alkoxy-β,γ-Unsaturated Ketone, *J. Org. Chem.*, 42, 1850 (1977).

K. G. Hancock, P. L. Wylie, and J. T. Lau, Photochemistry of α-Hydroxy-β,γ-Unsaturated Ketones. A Photochemical Synthesis of 1,4-Diketones, *J. Am. Chem. Soc.*, *99*, 1149 (1977).

K. G. Hancock, J. T. Lau, and P. L. Wylie, Photochemical Synthesis of 1,4-Diketones via the 1,3-Acyl Shift of α-Hydroxy-β,γ-Unsaturated Ketones, *Tetrahedron Lett.*, 4149 (1974).

BELOIT COLLEGE
Beloit, WI 53511

Fall 1978 ug enrollment 977
Degrees offered BA, BS
Telephone 608-365-3391

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 0 Stockrm 0 Technician 1/4
3. 1978 seniors & their placement: Total 8 Grad. school 0 Industry 5 Professional schools 0 Other 3 .
4. Senior majors, average past five years: 10 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 8010 % used for teaching 70% Research 30%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR (Varian T-60)
   IR (Beckman IR-5A)
   UV-Vis (Beckman DBG, Perkin-Elmer EPS-3T)
   Environmental Chamber (Kysor-Sherer CER88L)
   Ultracentrifuge (Beckman L5-65B)
   GC (Barber Coleman 5340, Aerograph 202)
   AA (Perkin-Elmer 360 w/graphite tube furnace)
   Gel Electrophoresis (Buchler)
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 40 Computer literature search service? no Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 18 .
4. Computer facilities: Department: Teletype terminal.
   College: IBM 1802

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   $3000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Cullister $8000, Gulf Oil $20,000, Oscar-Mayer $15,000, General Motors $6000.
3. Faculty teaching loads: Contact hours 14 Load credit for research? no
4. Sabbatical or leave support for research:
   Full year at half pay or one semester at full pay approximately every seventh year.

FACULTY PROFILE

BROWN, WILLIAM H. (b. 1932). Professor and Chairman. B.S., 1954, Saint Lawrence University; M.A., 1955, Columbia University; Ph.D., 1958, Columbia University. *ORGANIC CHEMISTRY*. Synthesis of molecules of biological interest.

W.H. Brown, *Introduction to Organic and Biochemistry*, Second Edition, Willard Grant Press, 1978. W.H. Brown, *Introduction to Organic Chemistry*, Willard Grant Press, 1976.

ORDMAN, ALFRED B. (b. 1948) Assistant Professor. B.A., 1970, Carleton College. Ph.D., 1974, University of Wisconsin, Madison. *BIOCHEMISTRY*. Enzyme mechanisms, environmental modelling and fermentation, toxicology.

A.B. Ordman and S.K. Kirkwood, UDP glucose dehydrogenase: Kinetics and their Mechanistic Implications, *Biochem. Biophys. Acta*, *481*, 25 (1977).

A.B. Ordman and S.K. Kirkwood, Mechanism of Action of UDP glucose dehydrogenase: Evidence for an essential lysine at the active site, *J. Biol. Chem.*, *252*, 1320 (1977)

Grant active 1978: Cullister Fund $4,000.

SPENCER, BROCK (b. 1939) Professor. B.A., 1961, Carleton College; Ph.D., 1965, University of California, Berkeley. *PHYSICAL* and *INORGANIC CHEMISTRY*. Structural and spectroscopic properties of inorganic materials.

J.B. Spencer, J.-O. Lundgren, Hydrogen Bond Studies LXXIII. The Crystal Structure of $CF_3SO_3^-H_3O^+$ at 298 and 83K. *Acta Cryst.*, *B29*, 1923 (1973).

Grants active 1977-8: Wisconsin Department of Natural Resources and Colt Industries, $4600, ambient air quality studies.

BEREA COLLEGE
Berea, KY 40404

Fall 1978 ug enrollment 1440
Degrees offered B.A.
Telephone (606) 986-9341

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2.Support staff: FTE's secretary 1/3 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 13 Grad. school 6 Industry 3
Professional schools 4 Other 0 .
4. Senior majors, average past five years: 9 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)
None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 8000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60Hz(P-E R-24)
MS (Varian EM600)
UV-Vis (P-E 102)
IR (P-E 337 and 710)
AA (P-E 107)
GC (P-E 810, Varian 700 and 3760)
γ Spec (400 Ch Victoreen)

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No
Total journal subscriptions? 9 Computer literature search service? No
Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 4 .
4. Computer facilities: Campus: IBM 1130. Berea College has recently (1978) received a $250,000 NSF grant to substantially increase its computer capabilities.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: None
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
Dreyfus Grant for 1976-1978 for $26,000.
3. Faculty teaching loads: Contact hours 12-13 Load credit for research? None
4. Sabbatical or leave support for research:
Sabbatical leave possible each eighth year at 2/3 salary for full year or full salary for 1/2 year.

FACULTY PROFILE

BEEBE, THOMAS R. (b. 1932) Professor. B.A. and B.S., 1954, Ohio University, Ph.D., 1960, University of Wisconsin. Organic Chemistry. Preparation and reactivity of positive organic halogens.

T.R. Beebe, B.A. Barnes, K.A. Bender, A.D. Halbert, R.D. Miller, M.L. Ramsay, and M.W. Ridenour, Oxidation of Alcohols with Acetyl Hypoiodite, J. Org. Chem., 40, 1992(1975).

T.R. Beebe, A.L. Lin, and R.D. Miller, Reaction of N-iodosuccinimide with Secondary Alcohols, J. Org. Chem., 39, 722(1974).

BLAIR, LARRY K. (b. 1944) Associate Professor. B.A., 1966, Berea College, Ph.D., 1970, Stanford University. Physical-Organic Chemistry. Halogen-amine complexes, synthesis and reactions.

L.K. Blair, J. Baldwin, Glen E. Tate, S.L. Price, and M.S. Co, Halogen-Amine Complexes in Chemical Synthesis. 2. Quinuclidine-Br_2 Complexes. A New Source of Active Bromine, accepted for publication, J. Org. Chem..

L.K. Blair, J. Baldwin, and W.C. Smith, Jr., Halogen-Amine Complexes in Chemical Synthesis. 1. The Oxidation of Alcohols by 1,4-Diazabicyclo[2.2.2]-octane·$2Br_2$ Complex, J. Org. Chem., 42, 1816(1977).

O.I. Asubiojo, L.K. Blair, and J.I. Brauman, Tetrahedral Intermediates in Gas-Phase Ionic Displacement Reactions at Carbonyl Carbon, J. Am. Chem. Soc., 97, 6685(1975).

J.I. Brauman and L.K. Blair, Ion Cyclotron Resonance Spectroscopy, in Determination of Organic Structures by Physical Methods, Vol. 5, F.C. Nachod and J.J. Zuckerman, Editors, Academic Press, New York, 1973.

L.K. Blair, P.C. Isolani, and J.M. Riveros, Formation, Reactivity, and Relative Stability of Clustered Alkoxide Ions by Ion Cyclotron Resonance Spectroscopy, J. Am. Chem. Soc., 95, 1057(1973).

LEVEY, GERRIT (b. 1924) Professor. B.A., 1946, Hope College, Ph.D., 1949, University of Wisconsin. Physical Chemistry. Peroxide reaction mechanisms.

G. Levey and E.J. Hart, Gamma Ray and Electron Pulse Radiolysis Studies of Aqueous Peroxodisulfate and Peroxodiphosphate Ions, J. Phys. Chem., 79, 1642(1975).

BETHANY NAZARENE COLLEGE

Bethany, OK 73008

Fall 1978 ug enrollment 1311

Degrees offered B.S.

Telephone (405) 789-6400

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 2.3. 2. Support staff: FTE's secretary .2 Stockrm .5 Technician ____
3. 1978 seniors & their placement: Total 4 Grad. school 1 Industry 1 Professional schools 2 Other 0.
4. Senior majors, average past five years: 3.
5. Students involved in research, average past five years: Acad. yr. 4 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 10,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR-60MHz (Varian EM-360)
UV-Vis (Beck. DBG)
IR (Beck. IR-10)
GC (two H-P 7620A, H-P 5730A, P-E 800, F & M 700)
AA (B&L AC2-20)
Spinning Band (Nester-Faust)
Dig. Integ. (H-P 3371A)

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No Total journal subscriptions? 15 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 5.
4. Computer facilities:

Campus: IBM-System 34

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $1,500 chemicals, glassware, equipment.
   $4,000 for summer research from Catalysts (Science-Alumni Group).
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   None
3. Faculty teaching loads: Contact hours 18 Load credit for research? No
4. Sabbatical or leave support for research:
   Faculty can apply for sabbatical at 50% salary full year, full salary for 1/2 year. Frequency, every 7th year.

FACULTY PROFILE

BEAVER, W. DON (b. 1924) Professor. B.S., 1946, Bethany Nazarene College, M.S., 1953, Ph.D., 1955, Oklahoma State University. Analytical-Physical Chemistry. Analytical Instrumentation; Trace metal determination.

HEASLEY, GENE E. (b. 1932) Professor. B.A., 1955, Hope College, Ph.D., 1961, Kansas University. Organic Chemistry. Mechanisms of electrophilic addition to alkenes and dienes.

Sixteen publications, 1973-1978.

G.E. Heasley, V.L. Heasley, *J.McCall Bundy, *Stanley Arnold, *Alice Gipe, *David McKee, *Rob Orr, *S.L. Rogers, and D.F. Shellhamer, Electrophilic Additions to Dienes and the 1-Phenylpropenes with Pyridine-Halogen Complexes and Tribromides. Effects on Stereochemistry and Product Ratios, J. Org. Chem., 43, 2793(1978).

G.E. Heasley, *W.E. EmeryIII, *Robert Hinton, D.F. Shellhamer, V.L. Heasley, and *S.L. Rogers, Reaction of Methyl and tert-Butyl Hypochlorite with Cyclopentadiene, J. Org. Chem. , 43, 361(1978).

V.L. Heasley, G.E. Heasley, *Don Titterington, and *T.L. Rold, Reaction of Alkyl Hypobromites with Olefins in Nitroalkanes, J. Org. Chem., 41, 1285(1976).

G.E. Heasley, V.L. Heasley, *V.M. McCully, *R.A. Skidgel, and *R.T. Wiegman, Ionic and Radical Addition of Methyl Hypochlorite to Dienes, J. Org. Chem., 41, 644(1976).

G.E. Heasley, V.L. Heasley, *P.D. Davis,*D.C. Hayse,*D.M. Ingle,*G.R. McClung, *K.D. Rold, *D.K. Strickland, and *T.S. Ungermann, Studies on the Ionic Addition of Chlorine to Conjugated Dienes, J. Org. Chem., 41, 334(1976).

Grants active 1977-1978: Research Corporation Cottrell College Science Grant, $6,500. Studies on Electrophilic Additions to Olefins and Dienes. Received jointly with V.L. Heasley, Point Loma College.

REINBOLD, PAUL E. (b. 1943) Professor, A.B., 1965, Olivet Nazarene College, M.S., 1968, Purdue University, Ph.D., 1968, Texas A&M University. Analytical-Inorganic Chemistry. Chemical Instrumentation; Spectropolarimetric investigation of metal complexes.

*Randy Classen, *Randy Wolcott, and P.E. Reinbold, A Study by NMR of a Three-Component System: A Physical Organic Experiment, J. Chem. Ed., 55, 542 (1978).

K.H. Pearson, W.R. Howell, P.E. Reinbold, and S. Kirschner, A General Non-aqueous Method for the Preparation of Di and Triamine complexes of Cobalt (III) and Nickle (II), Inorganic Synthesis, XIV, 57-63(1973).

BOWDOIN COLLEGE

Brunswick, Maine 04011

Fall 1978 ug enrollment 1350

Degrees offered A.B.

Telephone (207) 725-8731

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5.5. 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 2
3. 1978 seniors & their placement: Total 24 Grad. school 6 Industry 2 Professional schools 10 Other 6.
4. Senior majors, average past five years: 18.
5. Students involved in research, average past five years: Acad. yr. 12 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 27,900 % used for teaching 71% Research 29%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR	(P-E R-24B)	Laser-Raman	(Cary 83)
AA	(P-E 303)	IR	(P-E 621, 700, 21)
GC	(P-E F-11, 900, 990, 3920B)		
UV-Vis	(Beck. 24, P-E 202)		

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 41 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 20.
4. Computer facilities: Time-shared DEC-System 10. Terminal in Chemistry Building.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. 2,000/yr for expendables; 4000/yr capital equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 8 Load credit for research? no
4. Sabbatical or leave support for research: 50% salary for full year or full salary for 1/2 year--every 7th year.

FACULTY PROFILE

ARMSTRONG, DANIEL W. (b. 1949) Assistant Professor. B.S., 1972, Washington and Lee University, M.S., 1974, Texas A&M University, Ph.D., 1977, Texas A&M University. Organic and Analytical Chemistry. Interactions and Reactions of Biomonomers and Polymers in the Presence of Colloidal Aggregates.

Nine publications, 1974-1979.

D.W. Armstrong, F. Nome, J.H. Fendler and J. Nagyvary, Novel Prebiotic Systems: Nucleotide Oligomerization in Surfactant Entrapped Water Pools, J. Mol. Evol., 9, 213 (1977).

D.W. Armstrong and J.H. Fendler, Differential Partitioning of tRNAs Between Micellar and Aqueous Phases: A Convenient Gel Filtration Method for Separation of tRNAs, Biochem. Biophys. Acta, 478, 2, 75 (1977).

S. Spurlin*, W. Hinze and D.W. Armstrong, Use of an Aqueous Micellar Medium to Improve the Spectrophotometric Determination of Cyanide Ion with 5,5'-Dithiobis(2-Nitrobenzoic Acid), Analyt. Lett. 10, 12, 977 (1977).

D.W. Armstrong, R. Seguin* and J.H. Fendler, Partitioning of Amino Acids and Nucleotides between Water and Micellar Hexadecyltrimethylammonium Halides, J. Mol. Evol., 10, 241 (1977).

D.W. Armstrong, R. Seguin,* C.J. McNeal, R.D. Macfarlane and J.H. Fendler, Spontaneous Polypeptide Formation from Amino Acyl Adenylates in Surfactant Aggregates, J. Am. Chem. Soc., 100 (1978).

BAUM, J. CLAYTON (b. 1946) Assistant Professor. A.B., 1968, Williams College, M.S., 1971, Ph.D., 1976, Princeton University. Physical Chemistry. Molecular spectroscopy, including the study of photophysical and photochemical problems and energy transfer and relaxation processes.

BUTCHER, SAMUEL S. (b. 1936) Professor and Chairman. A.B. 1958, Albion College, Ph.D., 1963, Harvard University. Physical Chemistry. Atmospheric chemistry and air pollution.

*S.D. Boyce and S.S. Butcher, The effect of a local source on the composition of precipitation in South-central Maine, Water, Air, and Soil Pollution 6, 375 (1976).

S.S. Butcher, The correlation between light scattering and mass concentration of tobacco smoke, J. Air Poll. Control Assoc. 26, 997 (1976).

S.S. Butcher and *D.I. Buckley, A preliminary study of particulate emissions from small wood stoves, J. Air Poll. Control Assoc. 27, 346 (1977).

CHRISTENSEN, RONALD L. (b. 1945) Assistant Professor. A.B., 1967, Oberlin College, M.A., 1969, Harvard University, Ph.D., 1973, Harvard University. Physical Chemistry. Optical spectroscopy of conjugated systems of photochemical and photobiological significance, the effects of solvents on electronic structure.

Six publications, 1973-1978.

R.L. Christensen and J.H. vanderWalls, "X-Traps in Benzene Crystals: Phosphorescence Spectrum and Zero-Field Splitting of the Lowest Triplet State," Chemical Physics Letters 45, 221 (1977).

B.D. Cheson, R.L. Christensen, R. Sperling, B.E. Kohler, and B.M. Babior, "The Origin of the Chemiluminescence of Phagocytosing Granulocytes," The Journal of Chemical Investigation 58, 789 (1976).

R.L. Christensen and B.E. Kohler, "High Resolution Optical Spectroscopy of Polyenes Related to the Visual Chromophore," J. Phys. Chem. 80, 2197 (1976).

R.L. Christensen and B.E. Kohler, "Vibronic Coupling in Polyenes: High Resolution Optical Spectroscopy of 2,10-Dimethylundecapentaene," J. Chem. Phys. 63, 1837 (1975).

R.L. Christensen and B.E. Kohler, "Excitation Spectroscopy of Retinal and Related Polyenes," Photochemistry and Photobiology 19, 401 (1974).

CHRISTENSEN, RONALD L., cont'd

Grant Active, 1978-80: ACS-PRF(Type B), $13,000, Optical and Photochemical Studies of Simple Polyenes.

MAYO, DANA W. (b. 1928) Professor. B.S., 1952, Massachusetts Institute of Technology, Ph.D., 1959, Indiana University. Organic Chemistry. Natural products; marine chemistry; environmental effects of oil pollution.

Seven publications, 1973-1978.

D.W. Mayo, D.S. Page, J. Cooley, *E. Sorenson, F. Bradley, E.S. Gilfillan, and S.A. Hanson, Weathering Characteristics of Petroleum Hydrocarbons Deposited in Fine Clay Marine Sediments, Searsport, Maine, J. Fish. Res. Board Can., 35, 552 (1978).

E.S. Gilfillan, D.W. Mayo, D.S. Page, *D. Donovan, and S.A. Hanson, Effects of Varying Concentrations of Petroleum Hydrocarbons in Sediments on Carbon Flux in *Mya arenaria*, Part III. Petroleum Hydrocarbons, in Physiological Responses of Marine Biota to Pollutants, edited by T.J. Vernberg, A. Calabrese, F.P. Thurberg and W.B. Vernberg, Academic Press, New York 1977.

L.J. Bellamy and D.W. Mayo, Infrared Frequency Effects of Lone Pair Interactions with Antibonding Orbitals on Adjacent Atoms, J. of Phys. Chem., 80, 1217 (1976).

D.W. Mayo, *C.G. Cogger, *D.J. Donovan, *R.A. Gambardella, L.C. Jiang, and *J. Quan, The Ecological, Chemical, and Histopathological Evaluation of an Oil Spill Site, Part II. Chemical Studies, Marine Poll. Bull., 6, 166 (1975).

D.W. Mayo, *D.J. Donovan, L.C. Jiang, R.L. Dow and J.W. Hurst, Jr., Long-Term Weathering Characteristics of Iranian Crude Oil: The Wreck of the Northern Gulf, National Bureau of Standards Special Publication, No. 409, (1975) p. 201-208.

PAGE, DAVID S. (b. 1943) Associate Professor. B.S., 1965, Brown University, Ph.D. 1970, Purdue University. BioOrganic Chemistry. Reaction mechanisms of oxidative enzymes and model systems. Fate and effects of petroleum in the marine ecosystem.

D.W. Mayo, D.S. Page, J. Cooley, *E. Sorenson, F. Bradley, E. Gilfillan and S.A. Hanson, Weathering Characteristics of Petroleum Hydrocarbons Deposited in Fine Clay Marine Sediments, Searsport, Maine, J. Fisheries Res. Bd. Can. 35, 5 (1978).

E.S. Gilfillan, D.W. Mayo, D.S. Page, *D. Donovan, and S. Hanson, Effects of Varying Concentrations of Petroleum Hydrocarbons in Sediments on Carbon Flux in *Mya arenaria*, Physiological Responses of Marine Biota to Pollutants, F.J. Vernberg, et al. editors, Academic Press, 1977.

SETTLEMIRE, C. THOMAS (b. 1937) Associate Professor. B.S. 1959, Ohio State University, M.S. 1961, Ohio State University, Ph.D. 1967, North Carolina State University. Biochemistry. Membrane biochemistry.

Six publications, 1973-1978.

C.T. Settlemire and W.T. Hughes, Microbiology for Health Students. Reston-Prentice-Hall, 1978.

C.T. Settlemire, S. Huston, L.S. Jacobs, J.C. Havey, J.L. Howland, Action of some insecticides on membranes of liver mitochondria. Bull. Environ. Cont. Tox., 11:169.1974.

C.T. Settlemire, C.E. Bisbee*, and D.B. Carpenter*. Membrane Potential Measurements of Ascites Cells using ^{14}C-Thiocyanate, American Chemical Society Meeting, October 16, 1973.

J.H. Howland, J.W. Lichtman*, C.T. Settlemire, Inhibition of Mitochondrial respiratory chain by alkyl hydroxynaphthoquinones, Biochem. Biophys. Acta, 314: 154.1973.

BUCKNELL UNIVERSITY
Lewisburg, PA 17837

Fall 1978 ug enrollment 3130
Degrees offered B.S., A.B. & B.S.-M.S.
Telephone (717) 524-3258

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 10 . 2.Support staff: FTE's secretary 1½ Stockrm 1½ Technician 1½
3. 1978 seniors & their placement: Total 26 Grad. school 8 Industry 9 Professional schools 5 Other 4 .
4. Senior majors, average past five years: 28 .
5. Students involved in research, average past five years: Acad. yr. 27 Summer 33
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 49,174 % used for teaching 70% Research 30%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR - 60MHz (Varian A60A and EM 360)
UV-Vis (Cary 14 and Beckman DB-GT)
Dri-Lab Inert Atmosphere Box
Spectrofluorimeter (A-B SPF)
GC (P-E 900 and Varian 1740)
LC (P-E 601 and Waters ALC-GPC-244)
IR (P-E 137 and P-E 337)
Polarographic Analyzer (P.A.R. 174)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 108 Computer literature search service? Yes Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 49 .
4. Computer facilities: Xerox-Honeywell Sigma VII Computer (Campus)

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $33,000/yr. chemicals and glassware; $10,000/yr. for equipment; $1,100 for travel.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Dow $750; Dreyfus $9000; General Electric $4,000; du Pont $6,500; Gulf $5,000; Merck $4,250; Union Carbide $5,000; Eastman Kodak $3,750; Other $1,000.
3. Faculty teaching loads: Contact hours 12 Load credit for research? occasional
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for ½ year. Frequency averages every 7th year.

COOPER, JOHN N. (b. 1938) Associate Professor. B.S., 1960, California Institute of Technology, Ph.D., 1964, University of California (Berkeley). *Physical/Inorganic Chemistry*. Kinetics of inorganic substitution and redox reactions.

Six publications, 1973-78.

J.N. Cooper, *G.E. Staudt, *M.L. Smalser, *L.M. Settzo and G.P. Haight, Ligand Capture in Reductions of Cr(VI), *Inorg. Chem.*, *12*, 2075(1973).

*R.A. Scott, G.P. Haight and J.N. Cooper, Proton Assisted Two-Electron Transfer from Hydroxylammonium Ion to Cr(VI) Through Oxygen Bridges, *J. Amer. Chem. Soc.*, *96*, 4136(1974).

J.N. Cooper, M. Woods, J. Sullivan and E. Deutsch, Kinetics of Oxidation of Se(IV) by Np(VII) in Aqueous Acidic Perchlorate Media, *Inorg. Chem.*, *15*, 2862(1976).

J.N. Cooper, *W. Reents, M. Woods, R. Sjoblom and J. Sullivan, Kinetic Study of the Reduction of Np(VI) and Pu(VI) by Iodide Ion in Aqueous Perchlorate Media, *Inorg. Chem.*, *16*, 1030(1977).

J.N. Cooper, M. Woods, R. Sjoblom and J. Sullivan, Kinetic Study of the Reduction of Np(VII) and Am(VI) by Bromide Ion in Aqueous Perchlorate Media, *Inorg. Chem.*, *16*, 2267(1977).

HEINE, HAROLD W. (b. 1922) Professor and Head. B.S., 1944, Rutgers University, Ph.D., 1948, Rutgers University. *Heterocyclic Chemistry*. Aziridines, diaziridines, benzodiazepines, nitrones, neighboring group effects, 1,3-dipolar additions.

Eight publications, 1973-78.

H.W. Heine and *C. Tintel, The Synthesis of a 2,4-Benzodiazepine-1,5-dione and a 1,3-Diazepine-4,7-dione, *Tetrahedral Letters* 23(1978).

*R.H. Heistand, *M.A. Stahl and H.W. Heine, The Reaction of α-Aryl-N-Alkyl- and α,N-Diarylnitrones with Aroyl Chlorides. A New Synthesis of N-alkyl-O-aroylhydroxylamines, *J. Org. Chem.*, *43*, 3613(1978).

H.W. Heine, L.M. Baclawski, S.M. Bonser and G.D. Wachob, Reactions of Some 1,2-Diacyldiaziridines, *J. Org. Chem.*, *41*, 3229(1976).

H.W. Heine and L. Heitz, Reaction of 1,1-Dialkyl-1-H-Diazirino[1,2-b]-phthalazine 3,8-diones with Nitrones, *J. Org. Chem.*, *39*, 3192(1974).

H.W. Heine, *R. Henrie, L. Heitz and S.R. Kovvali, Reactions of Some 1,1-Dialkyl-1H-Diaziridino[1,2-b]phthalazine-3,8-diones, *J. Org. Chem.*, *39*, 3187(1974).

Grants active 1977-78: Petroleum Research Fund, $6,500, Chemistry of Nitrones.

KIEFT, LESTER (b. 1912) Professor. A.B., 1934, Hope College, Ph.D., 1939, Pennsylvania State University. *Analytical/Inorganic Chemistry*.

OSTERHOUT, KEITH R. (b. 1946) Laboratory Director and NMR Operator. B.S., 1968, Rensselaer Polytechnic Institute, Ph.D., 1973, Massachusetts Institute of Technology. *Organic Chemistry*. Organic synthesis.

ROOT, CHARLES A. (b. 1938) Associate Professor. A.B., 1960, Ohio Wesleyan University, M.S., 1962, The Ohio State University, Ph.D., 1965, The Ohio State University. *Inorganic Chemistry*. Complexes of aziridine and azetidine derivatives.

Three publications, 1973-78.

R.C. Rosenberg, C.A. Root, R.-H. Wang, M. Cerdonio and H.B. Gray, The Nature of the Ground States of Cobalt(II) and Nickel(II) Carboxypeptidase A, *Proc. Nat. Acad. Sci. USA*, *70*, 161(1973).

R.C. Rosenberg, C.A. Root and H.B. Gray, Electronic Spectral and Magnetic Susceptibility Studies of Nickel(II) and Cobalt(II) Carboxypeptidase A Complexes, *J. Amer. Chem. Soc.*, *97*, 21(1975).

ROOT, CHARLES A., cont'd

R.C. Rosenberg, C.A. Root, P.K. Bernstein and H.B. Gray, Spectral Studies of Copper(II) Carboxypeptidase A and Related Model Complexes, J. Amer. Chem. Soc., 97, 2092(1975).

Grant active 1977-78: The Petroleum Research Fund, $5,500, Reactions of Aziridine and Azetidine Complexes.

SCOUTEN, WILLIAM H. (b. 1942) Associate Professor. A.B. 1964, Houghton College, Ph.D., 1969, University of Pittsburgh. Biochemistry. Biochemical preparations and enzyme reactions.

Twelve publications, 1973-78.

W.H. Scouten, *H. Knowles, Jr., *L.C. Freitag and *W. Lobst, Lipoamide Dehydrogenase Immobilized on Porous Glass, Biochim. Biophys. Acta, 382, 11(1977).

W.H. Scouten and *G.L. Firestone, N-propyldihydrolipoamide Glass Beads: An Immobilized Reducing Agent, Biochim. Biophys. Acta, 453, 277(1976).

W.H. Scouten, *R. Lubcher and *W. Baughman, N-Dansylaziridine: A New Fluorescent Modification for Cysteine Thiols, Biochim. Biophys. Acta, 336, 421(1974).

*M.L. Roberts, W.H. Scouten and S.E. Nyquist, Isolation and Characterization of the Cytoplasmic Droplet in the Rat, Biology of Reproduction, 14, 421-424(1976).

W.H. Scouten, *F. Torok and *W. Gitomer, Purification of Lipoamide Dehydrogenase by Affinity Chromatography of Propyl Lipoamide-Glass Columns, Biochim. Biophys. Acta, 309, 531(1973).

Grants active 1977-78: The Petroleum Research Fund, $5,500, α-Keto Acid Dehydrogenases; Dreyfus Teacher-Scholar Grant, $12,500.

SMITH, MANNING A. (b. 1915) Professor. A.B., 1937, Swarthmore College, Ph.D., 1940, Massachusetts Institute of Technology. Organic Chemistry. Periodate oxidation of flavonols.

Three publications, 1973-78.

M.A. Smith and J.R. Matz, 3-Substituted Flavones 2. The Reactions of 2-Methoxy-3-carbethoxyflavones with Phenylhydrazine, Hydroxylamine and Hydrazine, J. Org. Chem., submitted August, 1978.

M.A. Smith, *B.B. Sandel and *C.T. Morrow, 3-Substituted Flavones 1. Carbethoxymethyl Flavones, J. Org. Chem., submitted June, 1978.

M.A. Smith, *R.L. Levine and *K.G. Henzel, The Chemistry of Flavandione, Reaction with Base, J. Org. Chem., 39, 261 (1974).

VEENING, Hans (b. 1931) Professor. A.B., 1953, Hope College, M.S., 1955, Purdue University, Ph.D., 1959, Purdue University. Analytical Chemistry. High performance liquid chromatography and gas chromatography-mass spectrometry of biochemically active compounds.

Twelve publications, 1973-78.

E.J. Knudson, Y.C. Lau, H. Veening and D.A. Dayton, Time-Concentration Studies by HPLC of Metabolites Removed During Hemodialysis, Clin. Chem., 24, 686(1978).

*D.W. Bastian, *R.L. Miller, *A.G. Halline, F.C. Senftleber and H. Veening, High Performance Liquid Chromatography of Urinary Compounds, An Undergraduate Experiment, J. Chem. Educ., 54, 766(1977).

T.L. Masimore, H. Veening, W.J.A. VandenHeuvel and D.A.Dayton, Gas Chromatography-Mass Spectrometry of Acidic Components in Hemodialysate from Uremic Patients, J. Chromatog. Biomed. Appl., 143, 247(1977).

F.C. Senftleber,*A.G. Halline, H. Veening and D.A. Dayton, Reversed Phase Liquid Chromatographic Analysis of Hemodialysate from Uremic Patients, Clin. Chem., 22, 1522(1976).

H. Veening, High Resolution Liquid Chromatography, Crit. Rev. in Anal. Chem., 5, 165(1975).

VEENING, HANS, cont'd

Grants active 1977-78: NSF Research Grant, $25,000, Gas Chromatographic and Liquid Chromatographic Analysis of Physiological Fluids; Petroleum Research Fund (ACS) Research Grant, $5,500, HPLC of Physiological Fluids.

WILLEFORD, BENNETT R. (b. 1921) Professor. A.B., 1943, Emory University, M.S., 1949, University of Wisconsin, Ph.D., 1950, University of Wisconsin. *Physical/ Inorganic Chemistry*. Studies of arene metal carbonyls.

Four publications, 1973-78.

*S.R. Kurtz, O.T. Anderson and B.R. Willeford, A New Simple Apparatus for the Measurement of Dipole Moments, *J. Chem. Educ.*, *54*, 181(1977).

R.D. Rieke, J.S. Arney, W.E. Rich, B.R. Willeford, and *B.S. Poliner. Electrochemical Generation of Stable Arene Metal Tricarbonyl Dianions, *J. Amer. Chem. Soc.*, *97*, 5951(1975).

B.R. Willeford, Review of Liquid Chromatography by L.R. Snyder and J.J. Kirkland, *J. Organometal. Chem.*, *85*, C50(1975).

*S.A. Gardner, *R.J. Seyler, H. Veening and B.R. Willeford, Tricarbonylchromium Complexes of Some Substituted 9,10-Dihydro-9,10-*o*-benzenoanthracenes, *J. Organometal. Chem.*, *60*, 271(1973).

Grants active 1977-78: Deutscher Akademischer Austauschdienst, $5100 for Research at Institut für Anorganische Chemie, Technische Universität München, Feb.-July 1978.

WINSTEAD, MELDRUM B. (b. 1926) Professor. B.S., 1946, Davidson College, M.A., 1949 and Ph.D., 1952, University of North Carolina, Chapel Hill. *Organic Chemistry.* Carbon-11-labeled radiopharmaceuticals.

Eleven publications, 1973-78.

M.B. Winstead and H.S. Winchell, Structural Features Affecting the In Vivo Distribution Patterns of ^{11}C-Labeled Carboxylic Acids, Hydantoins, and Aminonitriles in *The Chemistry of Radiopharmaceuticals*, N.D. Heindel, H.D. Burns, T. Honda and L.W. Brady, Editors, Masson Publishing USA, Inc., New York, 1978, Chapter 16, pp. 224-268.

M.B. Winstead, *D.A. Dougherty, T.H. Lin, A. Khentigan, J.F. Lamb, and H.S. Winchell, Relationship of Molecular Structure to In Vivo Scintigraphic Distribution of Carbon-11-Labeled Compounds. 4. Carbon-11-Labeled Mandelonitriles, Mandelic Acids, and Their Esters, *Journal of Medicinal Chemistry*, *21*, 215-217(1978).

M.B. Winstead, *C.A. Ciccarelli and H.S. Winchell, Liberation of Cyanide from α-Aminonitriles Relative to Amygdalin, *Journal of Pharmacology and Experimental Therapeutics*, *205*, 751-756(1978).

M.B. Winstead, C.I. Chern, T.H. Lin, A. Khentigan, J.F. Lamb and H.S. Winchell, Synthesis and Preliminary Scintigraphic Evaluation of In Vivo Distribution of C-11 Lactic Acid and C-11 Lactonitrile, *International Journal of Applied Radiation and Isotopes*, *29*, 69-73(1978).

CALVIN COLLEGE

Grand Rapids, MI 49506

Fall 1978 ug enrollment 3,975

Degrees offered BS AB

Telephone (616) 949-4000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2. Support staff: FTE's secretary 1/2 Stockrm 1 Technician ____
3. 1978 seniors & their placement: Total 37 Grad. school 5 Industry 5 Professional schools 12 Other 15 .
4. Senior majors, average past five years: 35 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 25,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Jeol JNM-PMX 60)
IR(PE 700, Beckman Acculab 2)
UV-VIS (Beckman DB, DU, Hitachi PE124
GC (Varian 1200, Shinadzu GC4B)
DSC (DuPont 900)
AA (PE 103)
X-Ray (Seifert, Nonius)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 30 Computer literature search service? no Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 2 .

4. Computer facilities: Campus: Honeywell 636, Prime 400

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approximately $2000 for supplies, $2000 for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   DuPont $6500, NSF-URP $8870, Johnsons Wax Fund $2000

3. Faculty teaching loads: Contact hours 15 Load credit for research? no

4. Sabbatical or leave support for research:
   Faculty can apply for sabbatical leave after each 6 years of teaching, full salary for 1/2 year, 1/2 salary for full year.

FACULTY PROFILE

ALBERS, ROBERT J. (b. 1937) Professor. A.B., 1959, Calvin College, Ph.D., 1962, University of Connecticut. Biochemistry. Polypeptides Models for Protein Structure and Function.

G. Vanderkooi, K.M. Kale, R.J. Albers, L. Vitello, and G.C. Kresheck, Thermodynamics of Model Membrane Systems Studied by Titration Calorimetry, International Symposium on Biomolecular Structure, Conformation, Function and Evolution. R. Srinwasan, Editor, 1978.

BLANKESPOOR, RONALD L. (b. 1946) Associate Professor. B.A., 1968, Dordt College, Ph.D., 1971, Iowa State University. Organic Chemistry. Cyclic voltammetric and ESR studies of anion radicals; photoelectron spectroscopy of α-diketones.

Nine publications, 1973-1978.

G.R. Russell, V. Malatesta, and R.L. Blankespoor, Radical Anions of Substituted Cyclobutene-1,2-diones, J. Org. Chem., 43, 1837 (1978).

R.L. Blankespoor and *D. Gollehon, Long-Range Proton Electron Spin Resonance Splittings in Radical Anions of Bicyclo [2.2.1]hept-5-ene-2,3-diones, J. Org. Chem., 42, 63(1977).

R.L. Blankespoor and *C.M. Snavely, An ESR Study of the Radical Anion of 7,8-Dimethylene-1,3,5-cyclooctatriene, J. Org. Chem., 41, 207(1976).

R.L. Blankespoor and C.S.C. Chung, 7-Oxabicyclo-[2.2.1]hept-5-ene-2,3-dione and Its Radical Anion. An Experimental and Theoretical Study, J. Org. Chem., 40, 2443(1975).

R.L. Blankespoor, Radical Anions of Bicyclo[2.2.1]-hept-5-ene-2,3-diones, J. Amer. Chem. Soc., 96, 6196(1974).

Grant active 1978: Research Corporation Cottrell College Science Grant, $1,063, Electron Spin Resonance Studies of Transient Anion Radicals.

BROENE, HERMAN H. (b. 1919) Professor. A.B., 1942, Calvin College, Ph.D., 1947, Purdue University. Physical Chemistry. Thermodynamics, Chemical Education.

DEKOCK, ROGER L. (b. 1943) Associate Professor. A.B., 1965, Calvin College, Ph.D., 1970, University of Wisconsin-Madison. Inorganic Chemistry. Electronic structure and chemical bonding.

Ten publications, 1973-1978.

R.L. DeKock, Proton Affinity and the Frontier Orbital Concept; Predictions and Pitfalls, J. Am. Chem. Soc., 97, 5592(1975).

R.L. DeKock, Stability of Zerovalent Compounds in the Nickel Triad. Interplay of Ionization Potential and Electron Affinity, Inorg. Chim. Acta, 19, L 27(1976).

R.L. DeKock, *M.A. Shehfeh, D.R. Lloyd, and P.J. Roberts, Ultraviolet Photoelectron Spectra of Thiazyl Chloride, J. Chem. Soc. Faraday II, 72, 807(1976).

R.L. DeKock, Ultraviolet Photoelectron Spectroscopy of Inorganic Molecules, Chapter 6 of Electron Spectroscopy-Theory, Techniques, and Applications, Volume 1, edited by C.R. Brundle and A.D. Baker, Academic Press, New York, 1977, p. 293.

DIRKSE, THEDFORD P. (b. 1915) Professor. A.B., 1936, Calvin College, Ph.D., 1939, Indiana University. Physical and General Chemistry. Electrolytic Conductance in Non-aqueous Solutions.

W. VanDoorne and T.P. Dirkse Supersaturated Zincate Solutions , J. Electrochem. Soc., 122, 1(1975).

T.P. Dirkse, The Behavior of the Zinc Electrode in Alkaline Solutions. I The Effect of Ionic Strength at the Equilibrium Potential, J. Electrochem. Soc., to appear in October 1978 issue.

LEEGWATER, ARIE (b. 1940) Associate Professor. B.A., 1962, Calvin College, Ph.D., 1967, Ohio State University. Organic Chemistry. Intramolecular catalysis and stereochemistry, history of science.

N.E.H. FACULTY FELLOW-IN-RESIDENCE, 1977-78 $14,500.

PIERS, KENNETH (b. 1941) Professor. B.Sc.(Hon.) 1963, U. of Alberta, Ph.D., 1966, U. of Alberta. Organic Chemistry. Organic synthesis of natural products.

VANDOORNE, WILLIAM (b. 1937) Professor, Chairman. B.S., 1960, Calvin College, Ph.D., 1965, University of Michigan. Inorganic Chemistry. Crystallography, phosphorus and boron compounds, coordination compounds.

W. VanDoorne, A.W. Cordes, and G.W. Hunt, Crystal and Molecular Structure of Bis (triphenylphosphine)-diborane(4), Inorg. Chem. 12, 1686(1973).

W. VanDoorne and T.P. Dirkse, Supersaturated Zincate Solutions. J. Electrochem. Soc., 122, 1(1975).

R.E. Cramer, W. VanDoorne, and J.T. Huneke. Crystal and Molecular Structure of Tris(ethylenediamine)nickel(II) acetate dihydrate, Inorg. Chem., 15, 529 (1976).

R.E. Cramer, W. VanDoorne, and R. Dubois, Crystal and Molecular Structure and Isotropic Hydrogen-1 NMR Shifts of Hexa(acetic acid)nickel(II) tetrafluoroborate. Inorg. Chem., 14, 2462(1975)

Grant active 1978-1979: Research Corporation, Cottrell College Science Grant, $6,900, Complexes of Neutral Organic Acids.

CARLETON COLLEGE
Northfield, MN 55057

Fall 1978 ug enrollment 1696
Degrees offered B.A.
Telephone (507) 645-4431

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6.1 . 2. Support staff: FTE's secretary 0.55 Stockrm 1 Technician 0.04
3. 1978 seniors & their placement: Total 37 Grad. school 12 Industry 6
Professional schools 11 Other 8 .
4. Senior majors, average past five years: 27 .
5. Students involved in research, average past five years: Acad. yr. 11 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

Three NSF Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 19,000 % used for teaching 85% Research 15%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (P-E R24B)
MS (Varian EM 600)
GC (P-E 3920)
IR's (P-E 337 and 700)
Vacuum Line
AA (P-E 303)
Polarograph (P.A.R. 174)
Digital Coulometer (P.A.R. 179)
UV-Visible
two Cary 15's
Heath-Schlumberger 700 with Aminco-Morrow Stopped Flow Apparatus

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? no
Total journal subscriptions? 35 Computer literature search service? no
Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 30 .

4. Computer facilities: Department: Two DEC VT-50 video terminals, two DEC LA-36 Decwriter II, Tektronix 4010 graphics terminal, Teletype ASR 33. Campus: PDP 11/60 (256 kbyte) RSTS with many peripherals.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approximately $2,000/year for chemicals, project grants and travel expenses.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Du Pont College Science Grant, $6,500; Dreyfus Distinguished Scholar Lectureship, $8,000; NSF-ISEP grant for photochemistry & controlled potential coulometry, $5,100; Johnson's Wax Fund Grant, $2,000.
3. Faculty teaching loads: Contact hours 12 Load credit for research? none

4. Sabbatical or leave support for research: Faculty have one-third salary for a sabbatical leave after three years teaching, full salary for one-half year after six years teaching, two-thirds salary for full year after seven years teaching. Frequency averages every eighth year.

CARLIN, CHARLES H. (b. 1939) Professor. B.A., 1961, Carthage College, M.A., 1964, Ph.D., 1966, The Johns Hopkins University. Organic Chemistry. Analysis of pesticides and toxic trace elements in the environment.

C. H. Carlin, Vertebral Damage in Minnows Phoxinus phoxinus L. Exposed to Cadmium, Ambio, 4, 166 (1975).

CHILD, WILLIAM C., Jr. (b. 1927) Professor. B.A., 1950, Oberlin College, Ph.D., 1955, University of Wisconsin. Physical Chemistry. Efficiency of solar energy reflectors, thermodynamics and transport properties of fused salt cells, differential calorimetry.

FINHOLT, JAMES E. (b. 1933) Professor. B.A., 1955, St. Olaf College, Ph.D., 1960, University of California, Berkeley. Inorganic Chemistry. Preparation, structures and mechanisms of chromium(III) complexes.

J. E. Finholt and J. M. Williams, The Hydrated Proton $H^+(H_2O)_n$. III. A Neutron Diffraction Study of Deuterated Paratoluene Sulfonic Acid Monohydrate, $D_3O^+CH_3C_6H_4SO_3^-$, and an Analysis of the Effect of Deuteration on Oxonium Ion Geometry, J. Chem. Phys., 59, 5114 (1973).

MILLS, NANCY S. (b. 1950) Assistant Professor. B.A., 1972, Grinnell College, Ph.D., 1976, University of Arizona. Organic Chemistry. Delocalized Y-aromatic polyanions, transition-metal sandwich compounds.

Grants active in 1978-1979: Research Corporation Cottrell College Science Grant, $3,300, Cross-Conjugated Dianions as Potentially Aromatic Species. Petroleum Research Fund - Type B, $8,700, Delocalized Dicarbanions.

MOHRIG, JERRY R. (b. 1936) Professor and Chairman. B.S., 1957, University of Michigan, Ph.D., 1963, University of Colorado, Boulder. Organic Chemistry. Stereochemistry of 1,2-elimination reactions, enzymic catalysis, the structure and chemistry of alkanediazonium ions.

J. R. Mohrig and D. C. Neckers, Laboratory Experiments in Organic Chemistry, 3rd Edition, D. Van Nostrand Company, 1979.

J. R. Mohrig and *S. M. Shapiro, An Enzyme-Catalyzed Resolution of Amino Acids, J. Chem. Educ., 53, 586 (1976).

J. R. Mohrig, *K. Keegstra, *A. Maverick, *R. Roberts and *S. Wells, Bimolecular Displacement of Nitrogen (S_N2) in an Alkanediazonium Ion, Chem. Comm., 1974, 780.

RAMETTE, RICHARD W. (b. 1927) L. M. Gould Professor of Chemistry. B.A., 1950, Wesleyan University, Ph.D., 1954, University of Minnesota. Analytical Chemistry. Aqueous solution equilibria, electroanalytical chemistry.

K. H. Khoo, R. W. Ramette, C. H. Culberson and R. G. Bates, Determination of Hydrogen Ion Concentrations in Seawater from 5 to 40 °C: Standard Potentials at Salinities from 20 to 45 ‰, Anal. Chem., 49, 29 (1977).

R. W. Ramette, C. H. Culberson and R. G. Bates, Acid-Base Properties of Tris-(hydroxymethyl)aminomethane (Tris) Buffers in Seawater from 5 to 40 °C, Anal Chem., 49, 867 (1977).

R. W. Ramette, On Deducing the pK-Temperature Equation, J. Chem. Educ., 54, 280 (1977).

Grants active in 1978-1979: NSF Local Course Improvement, $17,800, New Experiments for Analytical Instruction.

SMITH, DAVID F. (b. 1951) Assistant Professor. B.S., 1973, Davidson College, Ph.D., 1978, University of North Carolina at Chapel Hill. Analytical Chemistry. Applications of microcomputers in analytical chemistry, cyclic voltammetry and chronoamperometry, stopped-flow kinetics.

CARROLL COLLEGE
Waukesha, WI 53186

Fall 1978 ug enrollment 1138
Degrees offered B.A. and B.S.
Telephone (414) 547-1211

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 1/3 Stockrm 3/4 Technician 1/2
3. 1978 seniors & their placement: Total 8 Grad. school 2 Industry 3 Professional schools 2 Other 1 .
4. Senior majors, average past five years: 11 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 8700 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (P-E R-24B)
LC (Waters)
IR (P-E 599 and 727)
UV-Vis (P-E 550 and Hitachi-Coleman 397)
AA (Techtron Model 5)
GC (Varian 3700 and Carle 311)
Fluorometer (Farrand Mark I)
Polarograph (Princeton Applied Research Model 364)

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No Total journal subscriptions? 20 Computer literature search service? Yes Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 10 .

4. Computer facilities: Department: minicomputer, General Automation SPC-12. Campus: General Automation 18/30 with time sharing capabilities; IBM 5100.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $5000/year chemicals and glassware; $6000/year for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
du Pont College Science Grant, $6500
Dreyfus Foundation Special Grant, $13,508
ISEP, $8800
Department of Energy, $4000
3. Faculty teaching loads: Contact hours 15 Load credit for research? Occasional

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 7th year.

FACULTY PROFILE

BAYER, RICHARD E. (b.1932) Professor. B.S., 1954, Carroll College, Ph.D., 1959, Indiana University. President of Bionomics Corporation. Analytical Chemistry. Contract research involving undergraduates, 137 different projects per year, volume of business exceeds $60,000. Areas of work include water chemistry, food chemistry, cosmetics, polymer chemistry and environmental chemistry.

HUDSON, EARL N. (b. 1938) Associate Professor, Chairman. B.S., 1960, Albion College, Ph.D., 1970, University of Illinois. Biochemistry. Fluorescence spectroscopy and analysis of Vitamin A.

E.N. Hudson and G. Weber, Synthesis and Characterization of Two Fluorescent Sulfhydryl Reagents, Biochemistry, 12, 4154 (1973).
National Science Foundation Professional Development Award, $15,000.

LEVIN, ALAN I. (b. 1951) Assistant Professor. B.S., 1973, University of California, Los Angeles, Ph.D., 1976, University of California, Berkeley. Physical Chemistry. Optical activity of helical polymers; polynucleotide conformation. Symmetry properties in classical mechanics. Dynamical systems theory.

A.I. Levin and I. Tinoco, Jr., Classical Theory of Circular Dichroism in Infinite Helical Polymers, J. Chem. Phys., 66, 3491 (1977).

J. Greve, M.F. Maestre, and A. Levin, Circular Dichroism of Adenine and Thymine Containing Synthetic Polynucleotides, Biopolymers, 16, 1489 (1977).
Cottrell College Science Grant from the Research Corporation, "Calculations of Circular Dichroism in Polynucleotides," $5,000.

WATKINS, RICHARD J. (b. 1941) Associate Professor. B.S., 1965, Carroll College, Ph.D., 1969, Indiana University. Organic Chemistry. Synthesis and reactions of small-ring compounds.

R.J. Watkins, J.K. Crandall, C.F. Mayer, and J.P. Arrington, The Photochemistry of 4-Cyclooctenone, J. Org. Chem., 39, 248 (1974).

CENTRAL COLLEGE

Pella, Iowa 50219

Fall 1978 ug enrollment 1325

Degrees offered B.A.

Telephone 515/628-4151

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2. Support staff: FTE's secretary 0 Stockrm ½ Technician 0
3. 1978 seniors & their placement: Total 5 Grad. school 1 Industry 3 Professional schools 0 Other 1 .
4. Senior majors, average past five years: 5 .
5. Students involved in research, average past five years: Acad. yr. 1 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

One NSF Graduate Fellowship.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 14,000 % used for teaching 95 Research 5
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   - Varian EM 360 nmr spectrometer
   - Cary 15 uv-visible spectrometer
   - Perkin-Elmer 337 ir spectrometer
   - Jarrell-Ash 850 atomic absorption spectrometer
   - Varian 1200 gas chromatograph
   - F & M 609 gas chromatograph
   - International B-20 refrigerated centrifuge
   - Buchler refrigerated fraction collector
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? 1st six Total journal subscriptions? 20 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 0 .
4. Computer facilities:

PDP 11/70. Two interactive terminals in science building.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approx. $300/yr. for chemicals and glassware.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

0

3. Faculty teaching loads: Contact hours 16 Load credit for research? Only when students are receiving credit for research.
4. Sabbatical or leave support for research:

Up to one-half salary support for a year or up to full salary support for one term can be obtained for approved programs. Sabbatical leaves are not automatic.

FACULTY PROFILE

BOSCH, ARTHUR J. (b. 1928) Professor and Chairman. B.A., 1951, Central College, Ph.D., 1958, University of Wisconsin, Madison. Biochemistry. Kinetic Properties of Enzymes.

A. J. Bosch, A Safe Technique for Removing Glass Tubing from Rubber Stoppers, J. Chem. Educ., 50, 113(1973).

CRICHTON, DAVID (b 1931) Professor. B.A., 1952, Hope College, M.S., 1955, Purdue University, Ph.D., 1962, University of Iowa. Analytical Chemistry. Philosophy and History of Science.

OGREN, PAUL J. (b. 1941) Associate Professor. B.A., 1963, Earlham College, Ph.D., 1968, University of Wisconsin, Madison. Physical Chemistry, Inorganic Chemistry. Fast gas-phase reactions, Complexes of Main Group halides.

C. J. Hochanadel, J. A. Ghormley, P. J. Ogren and J. W. Boyle, "Absorption Spectrum and Reaction Kinetics of the Methylperoxy Radical," J. Phys. Chem., 81, 3(1977).

S. M. Koop and P. J. Ogren, "HO_2 Kinetics in Simple Systems--An Introductory Problem in Computer Simulation," J. Chem. Educ., 53, 129(1976).

P. J. Ogren, "Analytical Results for First-Order Kinetics in Flow Tube Reactors with Wall Reactions," J. Phys. Chem., 79, 1749(1975).

P. J. Ogren, L. Steenhoek, K. S. Greve and W. C. Hutton, "Synthesis and NMR Characterizations of Representative Aluminum Iodide-Ether Complexes," J. Inorg. Nucl. Chem., 37, 293(1975).

CHRISTIAN BROTHERS COLLEGE
Memphis, TN 38104

Fall 1978 ug enrollment 1100
Degrees offered BS
Telephone (901) 278-0100

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 7 Grad. school 2 Industry 4 Professional schools 1 Other 0 .
4. Senior majors, average past five years: 3 .
5. Students involved in research, average past five years: Acad. yr. 2 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 12,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR (Varian T-60)
IR (Beckman IR-10)
UV-Vis (Beckman DB-G)
AA (Beckman)
GC with temperature
Programer (Sargent-Welch)
GC-Isothemal (Gow-Mac)
Metal Atom Reactor

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? some Total journal subscriptions? 16 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 2 .
4. Computer facilities: IBM 1130

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Common chemicals and standard glassware $1,000.00/year.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: URP $6,000
3. Faculty teaching loads: Contact hours 16 Load credit for research? occasional
4. Sabbatical or leave support for research: Leave of absences granted.

FACULTY PROFILE

COOPER, MARGUERITE B. (b. 1917) Assistant Professor. B.A., 1937, Womens College of North Carolina, M.S., 1968, Memphis State University, Ph.D., 1974, Memphis State University. Isolation of the DNA-protein complex from Escherichia coli and comparison of the acid-soluble proteins with histones. The effect of barbituates, steroid hormones, and metal cofactors and inhibitors on glycolysis in cell free extracts, carbonic anhydrase, invertase, lipase, and (in the future) other enzyme systems.

DOODY, J. EDWARD, (b. 1925) Professor, B.S., 1946, St. Mary's Minn., M.S., 1950, Ph. D. 1953, St. Louis University, Physical Chemistry, Electrochemistry.

R.A. Durst, F. E. Brinckman, K.L. Jewett, J.E. Doody, "Electrochemical Studies of the Methylmercury Cation", Proc. 8th Materials Research Symposium, NBS, Washington, D.C., September 1976.

M.M. Powell. J.H. Luckey, C.R. McGlasson, J.E. Doody, "Educational Symphony to meet Emerging Teacher Needs," Proc. Assn. for Supervision and Curriculum Development Conference, March 1977.

OELKERS, BROTHER JAMES ALBERT, (b. 1916) Associate Professor. B.S., 1938, St. Mary's College, Winona, Mn., M.S. 1947 Catholic University of America. D. C. Physical Chemistry. Mechanisms of Reduction of Copper Oxide Films by Hydrogen and Carbon Monoxide.

WESCOTT, LYLE D. JR., (b. 1937) Professor and Head. B.S., 1959, Georgia Institute of Technology, Ph. D., 1963, The Pennsylvania State University. Organic Chemistry. Reactions of metal atom species with organic substrates.

Peter K. Freeman, Thomas A. Hardy, John R. Balyeat and Lyle D. Wescott, Jr., Hydrogen Migration in 2-Carbena-6,6-dimethylnorbornane, J. Org. Chem, 42, 3356 (1977)

Lyle D. Wescott, Jr., *Clint Williford, *Frank Parks, *Margaret Dowling, *Susan Sublett and Kenneth J. Klabunde, Reactions of Magnesium Atoms with Cyclic Ketones, J. Am. Chem. Soc., 98, 7853 (1976)

Grants Active 1977-78: PRF 8947-B4,5, $10,100, Reactions of Metal Vapors with Carbonyl Compounds.

COE COLLEGE
Cedar Rapids, Iowa 52402

Fall 1978 ug enrollment 1050
Degrees offered B.A.
Telephone (319) 398-1553

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 1/10 Stockrm ½ Technician 3/8
3. 1978 seniors & their placement: Total 7 Grad. school 1 Industry 3 Professional schools 2 Other 1 .
4. Senior majors, average past five years: 8 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 93% Research 7%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (PE R24B)
GC - Bendix 2200
GC - Tracor 550 (EC
IR - Beckman IR-8
AA - PE-103
Centrifuge - Sorvall RC 2-B
UV-Vis - Beckman DK-2A
UV-Vis - Beckman DB

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No Total journal subscriptions? 18 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 9 .
4. Computer facilities:

Campus Digital pdp 11/70. Five academic terminals.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

$300

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

None

3. Faculty teaching loads: Contact hours 14 Load credit for research? No
4. Sabbatical or leave support for research: Sabbatical leaves - 50% salary full yr. full salary for ½ year. There also is a fund for sabbatical and other prof. development expenses. 25% is contributed by the individual faculty member. 75% is institutional and grant money.

FACULTY PROFILE

CARR, DUANE T. (b. 1932) Associate Professor. B.A., 1954 Western State College (Colorado), 1954, Ph.D., 1962, Purdue University. Physical Chemistry. Chemical Education, Computers in Chemistry, Science and Religion.

KEISER, JEFFREY E. (b. 1941) Associate Professor and Chairman. A.B., 1962, Kalamazoo College, Ph.D., 1966, Wayne State University. Organic Analytical Chemistry. Trace analysis for organic chemicals in a variety of matrices.

K. W. Kirby, J. E. Keiser, J. Groene, and E. F. Slach, Confirmation of Paranitrophenol as a Urinary Metabolite at the Nanogram Level, Accepted, J. Agric. & Food Chem., to appear March or April, 1979.

D. M. Baske, J. E. Keiser, R. V. Smith, The Gas Chromatographic Determination of Apomorphine in Plasma, J. Chromatogr., 140, 57 (1977).

P. W. Enhardt, R. V. Smith, T. T. Sayther, J. E. Keiser, Thin-Layer Chromatography of Apomorphine and its Analogs, J. Chromatogr., 116, 218 (1976).

J. E. Keiser, 2,4-Dinitrophenylhydrazine: An Illustration of the Use of NMR Spectroscopy. J. Chem. Educ., 51, 599 (1974).

WATKINS, STANLEY R. (b. 1929) Professor, B.S., 1951, New Mexico State University, Ph.D., 1958, University of Colorado. Analytical Chemistry. Trace metal analysis in biological systems.

S. R. Watkins, D. Cowman, R. M. Hodge, and P. P. Wickham, A Cadium Binding Serum Protein, Biochem. Biophys. Res. Commun., 74, 1403 (1977).

WICKHAM, PETER P. (b. 1935) Associate Professor, B.A., 1956, Amherst College, Ph.D., 1961, Massachusetts Institute of Technology. Organic Chemistry. Organic sysnthesis and the development of new synthetic reagents; studies on protein-metal association; modified RNA synthesis.

*A. L. Reese, *K. McMartin, and P. P. Wickham, Reactions of Bismuth Triacetate with Organic Compounds, J. Org. Chem., 38, 764 (1973).

S. R. Watkins, *D. Cowman, *R. M. Hodge, and P. P. Wickham, A Cadium-Binding Serum Protein, Biochem. Biophys. Res. Commun., 74, 1403, (1977).

*T. R. Koch and P. P. Wickham, A New Method for the Preparation of Bismuth (III) Triesters, accepted for publication in J. Org. Chem., 1979.

Grants active 1977-78: Local foundation, $2,500, Studies with Methylated Ribonucleic acids.

COLGATE UNIVERSITY
Hamilton, NY 13346

Fall 1978 ug enrollment 2300
Degrees offered BA, MAT
Telephone (315)824-1000, ext. 226

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 11 Grad. school 0 Industry 0
Professional schools 6 Other 5 .
4. Senior majors, average past five years: 11 .
5. Students involved in research, average past five years: Acad. yr. 9 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)
None

Facility, Library and Equipment Base

*New Chemistry Building in construction, opening Fall, 1979, w/new equipment.

1. Bldg. space: Ft^2 28,600 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

   1. NMR Hitachi-PE R-24
   *Varian 360L
   2. AA *Varian 575
   3. M.S. Hitachi-PE RMU6D
   4. X-ray Norelco 12045B/3
   5. VPC Varian 1400,920,200,90P; PE154
   6. IR PE 700, 710B, 257
   7. UV-VIS Cary 14; DU
   8. *Monochromator-multichannel Analyzer PAR 1205A, D MCP 218
   9. *HPLC: PE LC55
   10. *Liquid Scintillation: Packard C3380/554

3. Library resources: Chem. abstracts? Y Volume indices? Y Collected indices? Y
Total journal subscriptions? 40 Computer literature search service? N
Separate chemistry or science library? Y Librarian? Y Standing orders for review series and annual reviews (past five years) 3 .

4. Computer facilities: 160K PDP-10, with 3 disc drives, 35 terminals

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approximately $6000/year supplies, $6000/year equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Shell $500; Union Carbide $5,000, General Electric $4,000

3. Faculty teaching loads: Contact hours 16 Load credit for research? rare

4. Sabbatical or leave support for research: Faculty obtain sabbatical leave for full year at 1/2 salary or 1/2 year at full salary every seven years. May earn research leave 1/2 year at full pay every fourth year.

FACULTY PROFILE

BOWSER, JAMES (b. 1949) Assistant Professor B.S. 1971 Clarion College, Ph.D. 1976 Duke University. *Inorganic Chemistry*. Inorganic Synthesis; Bio-inorganic Chemistry.

R. Weiss, J. R. Bowser and R. N, Grimes, Studies of $2-(\eta^5-C_5H_5)CoB_4H_8$, A Cobalto Borane Analog of B_5H_9, *Inorg. Chem.*, 17, 1522 (1978).

J. R. Bowser, R. H. Neilson and R. L. Wells, Preparation and Thermal Decomposition Reactions of Some tert-Butyl dimethyl silyl-substituted Amino Boranes, *Inorg. Chem.*, *17*, 1882 (1978).

D. W. Graham, J. R. Bowser, C. G. Moreland, R. H. Neilson and R. L. Wells, Stability and Stereochemistry of Some Amino (bis) tri methyl silyl (amino) Boranes, *Inorg. Chem.*, *17*, 2028 (1978).

J. R. Bowser and R. N. Grimes, Nickel-Catalyzed Addition of Grignard Reagents to Silyl Acetylenes. Synthesis of Tetra Substituted Alkenes, *J. Amer. Chem. Soc.*, *100*, 4624 (1978).

K. Wong, J. R. Bowser, J. R. Pipal and R. N. Grimes, Tetracarbon Metallocarboranes. 5. A New Synthetic Route: Synthesis of $Co_2C_4B_6$ and CoC_4B_7 Nido Cage Systems by Fusion of Dicarbon Cobaltacarboranes in Ethanolic KOH. Crystal Structure of $(\eta^5-C_5H_5)_2Co_2C_4B_6H_{10}$, *J. Amer. Chem. Soc.*, *100*, 5045 (1978).

BRACKETT, ELIZABETH (b. 1931) Assistant Professor (part-time). B.S. 1953 University of Missouri, Ph.D. 1957 University of California, Berkeley. *Physical Chemistry*. X-ray Crystallography. Structure Determination of Small Molecules.

E. B. Brackett, C. E. Pfluger and M. T. Pfluger, 5-Methoxysalicylaldoxime *Acta Cryst.*, *B34*, 1017-1019 (1978).

COCHRAN, JOHN (b. 1935) Associate Professor B.A. 1957 College of Wooster, M.A. 1960 University of North Carolina, Ph.D. 1967 University of New Hampshire. *Organic Chemistry*. Chemistry of Group IV Organometallic Compounds.

GASPARRO, FRANCIS P. (b. 1944) Assistant Professor B.S. 1966 Villanova University, Ph.D. 1971 Princeton University. *Biophysical Chemistry*. Photochemistry and Photobiology of Adenine in Nucleic Acids.

F. P. Gasparro, N. H. Kolodny, NMR Determination of the Barrier to Rotation in N, N-Dimethylacetamide. A Physical Chemistry Experiment, *J. Chem. Ed.*, *54*, 258 (1977).

F. P. Gasparro, An Interesting and Inexpensive Solubility Product Experiment for Introductory Chemistry, *J. Chem. Ed.*, *53*, 98 (1976).

F. P. Gasparro, Remembering the Sign Convention for q and w in $\Delta E = q-w$, *J. Chem. Ed.*, *53*, 389 (1976).

Grants active 1977-78: Research Corporation (1977-79) $12,000, UV-Induced Adenine Photoproducts in Nucleic Acids, Colgate Research Council, $2,200.

LEWIS, DAVID K. (b. 1943) Associate Professor A.B. 1964 Amherst College, Ph.D. 1970 Cornell University. *Physical Chemistry*. Gas Phase Kinetics, Experimental Work Using Shock Tubes and Flow Systems. Twelve publications 1973-78.

D. K. Lewis, S. E. Ciesler* and M. S. Brown*, Further Study of Cyclopropane Structural Isomerization Behind Reflected Shock Waves, *Int. Jour. Chem. Kinetics*, *X*, 277 (1978).

S. H. Bauer and D. K. Lewis, Shock Tube Kinetics; Revitalized Old Problems and Some Evolving New Ones, *Proc. 11th Int. Symp. on Shock Tubes and Shock Waves*, Univ. of Wash. Press, Seattle, 1977.

D. K. Lewis, S. A. Feinstein* and P. M. Jeffers, Cyclobutane Thermal Decomposition Rates at 1300-1500 K, J. Phys. Chem., 81, 1887 (1977).

K. Varde and D. K. Lewis, Hydrogen Peroxide Emission Levels from a Hydrogen Fueled Internal Combustion Engine, Jour. Air Pollution Control Association, 27, 678 (1977).

D. K. Lewis, Di-tert-butyl Peroxide Decomposition Behind Shock Waves, Can. J. Chem., 54, 581 (1976).

Grant active 1977-78: Cottrell College Science Grant, $5,500, Kinetic and Mechanistic Studies of Unimolecular Reactions.

RESSNER, ERIC (b. 1948) Assistant Professor B.S. 1969 Clarkson College, Ph.D. 1974 University of Kansas. Organic and Biochemistry. Proteins which interact specifically with different forms of DNA. Design and synthesis of drugs which interact with DNA.

E. C. Ressner, P. Fraher, M. S. Edelman and M. P. Mertes, Synthesis of 5-Substituted Uracil Derivatives, J. Med. Chem., 19, 194 (1976).

W. R. Bauer, E. C. Ressner, J. Kates and J. V. Patzke, A DNA Nicking-closing Enzyme Encapsidated in Vaccinia Virus, Proc. Nat. Acad. Sci. USA, 74, 1841 (1977).

E. C. Ressner, M. P. Mertes and A. Kampf, S-Formyluracil Dimethyl Acetal, Nucleic Acid Chemistry, ed. L. B. Townsend and R. S. Tipton (John Wiley & Sons) 1978, p. 89

TAYLOR, ANNE K. (b. 1944) Assistant Professor B.A. 1966 Gettysburg College, Ph.D. 1973 Cornell University. Organic Chemistry. Synthesis and Food Chemistry.

THURNER, JOSEPH J. (b. 1920) Professor and Chairman B.S. 1949 Hartwick, M.A. 1951 Harvard. Inorganic Chemistry. Inorganic Trace Analysis and Inorganic Syntheses in Group IIIA; Error Analysis.

THE COLORADO COLLEGE
Colorado Springs, CO 80903

Fall 1978 ug enrollment 1850
Degrees offered B.A.
Telephone 303/473-2233 Ext 301

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2. Support staff: FTE's secretary 1 Stockrm 2 Technician 1
3. 1978 seniors & their placement: Total 12 Grad. school 2 Industry 1 Professional schools 4 Other 5 .
4. Senior majors, average past five years: 12 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 10,000 % used for teaching 100% Research 10%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

Perkin Elmer R-12 NMR w/Variable Temp & Double Resonance
Perkin Elmer 457 I.R.
Beckman DBG UV-Visible Spectrophotometer
Beckman Scintillation Counter
Dionex Ion Chromatograph
Sorvall RC5 Centrifuge
Perkin-Elmer 900 Gas Chromatograph
FOCI Spectrofluorometer Mark I
Perkin Elmer Atomic Absorption Spectrophotometer
Phillips X-Ray Generator w/Weissenberg and Precession Cameras

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 60 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 21 .
4. Computer facilities: Burroughs 6800

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approximately $2,500 for chemicals and glassware. Each year the Otis A. and Margaret T. Barnes Trust, which was established in December 1952, provides financial support for 10-14 full tuition scholarships for students majoring in chemistry, two to four summer undergraduate research participation stipends for Barnes Scholarship Recipients, and a yearly chemistry lecture to promote a better understanding of chemistry.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None
3. Faculty teaching loads: Contact hours 12-20 Load credit for research? No
4. Sabbatical or leave support for research: Every 7th year faculty may apply for sabbatical leave of full salary for 5/9 year or 50% salary for full year.

FACULTY PROFILE

BOWER, NATHAN W. (b. 1951), Assistant Professor, B.S. 1973, College of Wooster, Ph.D., 1977, Oregon State University. *Analytical Chemistry*. Precision of instrumental methods, sampling for real analysis, atomic spectroscopy, archaeometric methods.

N. W. Bower, R. H. Bromund, and R. H. Smith, Atomic Absorption for the Archaeologist, *J. of Field Archaeology*, *2*, 389 (1975).

N. W. Bower and J. D. Ingle, Jr., Precision of Flame Atomic Absorption Measurements of Copper, *Anal. Chem.*, *48*, 686, (1976).

R. H. Bromund, N. W. Bower, and R. H. Smith, Inclusions in Ancient Ceramics, An Approach to the Problem of Sampling for Chemical Analysis, *Archaeometry*, *18*, (1976).

N. W. Bower and J.D. Ingle, Jr., Precision of Flame Atomic Absorption Measurements of As, Cd, Ca, Cu, Fe, Mg. Mo, Na, and Zn, *Anal. Chem.*, *49*, 574 (1977).

N. W.Bower, J. J. Trunk, and J. Witt, Sample Size Selection for the Analysis of Pesticides in Tubers, *J. Ag. & Food Chem.*, *25*, 429 (1977).

CHAMPION, WILLIAM (b. 1930) Professor and Chairman. B. S. 1952 University of Illinois, Ph.D. 1958, Cornell University. *Organic Chemistry*. Synthesis and single crystal X-ray crystallography.

HITCHCOCK, ELDON T. (b. 1924) Professor. B. S. Western Michigan University, 1946. Ph.D. 1961, University of Michigan. *Analytical Chemistry*. Electroanalytical techniques and separation of lanthanide and actinide elements.

HUEBERT, BARRY J. (b. 1945) Assistant Professor. B. A. 1967, Occidental College. Ph.D. 1970. Northwestern University. Physical Chemistry. Sampling and analysis of trace gases and particles in the remote troposphere. Computer modeling of atmospheric reactions.

B. J. Huebert, Comment on Frohlinger and Kane, Technical comment, *Science*, *194*, 686 (1976).

B. J. Huebert and A. L. Lazrus, Global Tropospheric Measurements of Nitric Acid Vapor and Particulate Nitrate, *Geophys. Res. Letts*., *5*(7), 577-580 (1978).

Barry J. Huebert and Alan L. Lazrus, "Tropospheric Measurements of Nitric Acid Vapor and Particulate Nitrate," chapter in Nitrogenous Air Pollutants, Ann Arbor Science Publishers, 1979, Danniel Grossjean, Ed.

JONES, HAROLD L. (b. 1943), Associate Professor, B. S. Oregon State University, 1965, Ph.D., 1969, Colorado University. *Organic Chemistry*. Small ring chemistry, organic photochemistry, nuclear magnetic resonance spectroscopy, and computer aided analysis and simulation of n.m.r. spectra.

C. H. DePuy, H. L. Jones, and W. M. Moore, Cyclopropanols. X. Oxidation of Cyclopropanols by Photoexcited Aryl Ketones. *J. Amer. Chem. Soc.*, *95*,477(1973)

KESTER, KEITH B. (b. 1939) Associate Professor. B. A. 1961, Grinnell College, M. A. 1963 Harvard University, Ph.D. 1968, Harvard University. *Inorganic Chemistry*. Heterogeneous catalysis, radiofrequency chemistry reaction kinetics and gas chromatography.

G. Prada-silva, K. Kester, D. Löffler, R. L. Haller, J. B.Fenn, Recycling Molecular Beam Reactor, *Rev. Sci. Instrm.*, *48*, 897 (1977).

MICHEL, LESTER A. (b. 1919) Professor. B. S. 1941, Taylor University, M. S., 1944, Purdue University, Ph.D., 1947, Colorado University. Physical Chemistry. Calorimetry.

TABER, Richard L. (b. 1935) Professor. B. A. 1958, Colorado State College, Ph.D., 1963, University of New Mexico. Organic and Biochemistry. Bioorganic chemistry and enzymology.

Richard Taber, Scintillation Properties of Alkyl- and Alkoxy- Derivatives of 5,5'-Diphenyl-2,2'-bioxazole," Journal of Chemical and Engineering Data, 18, 436 (1973).

CONNECTICUT COLLEGE
New London, CT 06320

Fall 1978 ug enrollment 1590
Degrees offered BA, MA, MAT
Telephone (203) 442-5391

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5.3 . 2. Support staff: FTE's secretary 0.15 Stockrm 0.25 Technician 0
3. 1978 seniors & their placement: Total 5 Grad. school 2 Industry 1 Professional schools 0 Other 2 .
4. Senior majors, average past five years: 5 .
5. Students involved in research, average past five years: Acad. yr. 1.2 Summer 1.8
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 9392 % used for teaching 86 Research 14
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR	Perkin Elmer	R24A
IR	Perkin Elmer	727B
UV/VIS	Cary	14
UV/VIS	Varian	635
UV/VIS	Beckman DU/Guilford update	

GC Carle Basic
AA Perkin Elmer 290
Hydrogenation Apparatus-Parr 3910
Centrifuge-Sorvall RC-5

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 32 Computer literature search service? no Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 19 .
4. Computer facilities:

IBM1130, Tetronix 4051 Graphic System

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $300.00
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

None

3. Faculty teaching loads: Contact hours 9 Load credit for research? No
4. Sabbatical or leave support for research:

Sabbatical leave is granted after six years, and provides a full year at half salary or a semester at full salary.

FACULTY PROFILE

CULLEN, DAVID L. (b. 1940) Assistant Professor. B.S., 1963, University of California, Berkely, Ph.D., 1969, University of Washington, Seattle. Physical Inorganic Chemistry. Structures of Porphyrins and bile pigments. Twenty-one publications, 1973-1978

D. L. Cullen, E. F. Meyer, Jr., and K. M. Smith, Porphyrins and Large Metal Ions. The Crystal and Molecular Structure of 2,3,7,8,12,13,17,18-Octaethylporphinatomonochlorothallium (III), Inorganic Chemistry, 16, 1179, (1977)

D. L. Cullen, P. S. Black, E. F. Meyer, Jr., D. A. Lightner, G. B. Quistad and C. S. Pak, The Crystal and Molecular Structure of an Oxodipyrromethene Related to Bilirubin, Tetrahedron, 33, 477 (1977)

C. P. Hrung, M. Tsutsui, D. L. Cullen, and E. F. Meyer, Jr., Salt-type Complexes of Porphyrins: Monocation Octaethylporphinium tri-u-halegeno-hexacarbonyldirhenate (I), J. Am. Chem. Soc., 98, 7878 (1976)

D. L. Cullen and E. F. Meyer, Jr., The Crystal and Molecular Structure of 2,3,7,8,12,13,17,18-Octaethylporphinatomonopyridinezinc (II), Acta Cryst., B32, 296 (1976)

M. Tsutsui, C. P. Hrung, D. Ostfeld, T. S. Srivastava, D. L. Cullen and E. F. Meyer, Jr., Unusual Metallpporphyrin Complexes of Rhenium and Techetium, J. Am. Chem. Soc., 97, 3952 (1975)

HAMANAKA, BARBARA A. (b. 1941) Assistant Professor. B.S., 1963, DePaul, Ph.D., 1971, Harvard University. Organic Chemistry. Reactions of singlet oxygen with organic sulfides, X-ray crystallography of organic compounds.

HULBERT, MATTHEW H. (b. 1942) Associate Professor. B.S., 1964, Washington & Lee University; M.S., 1967, University of Wisconsin; Ph.D., 1969, University of Wisconsin. Analytical Chemistry. Electro-chemistry applied to kinetic problems and to soils.
Seven publications 1973-1978

M. H. Hulbert and S. Krawiec, Cometabolism: A Critique, J. Theoretical Biology, 69, 287 (1977)

R. H. Bennett, D. N. Lambert, and M. H. Hulbert, Geotechnical Properties of a Submarine Slide Area on the U. S. Continental Slope Northeast of Wilmington Canyon, Marine Geotech., 2, 245 (1977)

M. H. Hulbert and R. H. Bennett, Electrostatic Cleaning Technique for Fabric SEM Samples, Clays and Clay Min., 23, 331 (1975)

K. C. Burrows and M. H. Hulbert, Release of Heavy Metals from Sediments, Chapter 21 of Marine Chemistry in the Coastal Environment edited by T. M. Church, American Chemical Society, Washington, D. C., 1975

M. H. Hulbert and D. N. Given, Geotechnical and Chemical Property Relationships for Wilkinson Basin, Gulf of Maine, Sediments, J. Sed. Petr., 45, 504 (1975)

KASPEREK, GEORGE J. (b. 1943) Associate Professor. B.A., 1966, Mankato State College, Ph.D., 1969, Oregon State University. *Organic Chemistry*. Solution kinetics, reaction mechanisms of organic molecules.

Judith G. Kasperek and George J. Kasperek, Mixed Carboxylic-Sulfinic Anhydrides. Concerning the Synthesis of 1,2-Oxathiolan-5-one 2-oxide, *J. Org. Chem.*, *43*, 3393 (1978)

George J. Kasperek and R. F. Pratt, The Fumarase Reaction. A Magnetic Resonance Experiment for Biological Chemistry Students, *J. Chem. Ed.*, *54*, 515 (1977).

George J. Kasperek, P. Y. Bruice, T. C. Bruice, H. Yagi, and D. M. Jerina, The Oxygen Walk as a Complementary Observation to the NIH Shift. *J. Am. Chem. Soc.*, *95*, 1637 (1973)

George J. Kasperek, P. Y. Bruice, T. C. Bruice, H. Yagi and D. M. Jerina, The multiple Pathways for the Aromatization of 8,9-Indan oxide. *J. Am. Chem. Soc.*, *95*, 6041 (1973)

MC KEON, MARY GERTRUDE (b. 1926) Professor. B.A. Albertus Magnus College, 1947, M.S. 1951, PhD 1953, Yale University. Organic Chemistry. Synthesis and electrochemistry of organic compounds.

SMITH, TRUDY E. (b. 1924) Professor. A.B., 1944 Greensboro College, PhD., 1957, The Ohio State University. *Physical Chemistry*. Mass spectrometry and gas phase kinetics.

Trudy E. Smith, S. Ruven Smith and Fred W. McLafferty, Collisional Activation Mass Spectra of $[C_6H_8]^+$Ions, *Organic Mass Spectrometry*, *13*, 254, (1978)

CORNELL COLLEGE
Mount Vernon, IA 52314

Fall 1978 ug enrollment 880
Degrees offered BA
Telephone (319)-895 -8811

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3.5. 2. Support staff: FTE's secretary .5 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 7 Grad. school 1 Industry 1
Professional schools 3 Other 2.
4. Senior majors, average past five years: 8.
5. Students involved in research, average past five years: Acad. yr. 5 Summer 9
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,600 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Varian T-60)
X-ray (G. E. XRD-5 D/F)
MS (Varian EM-600)
UV-Vis (Beckman DK-2A; DU; DB)
IR (Beckman IR-20A; IR-5)
AA (Varian 1200)
LSC (Beckman CPM-100)
Mag. Susc. (Alpha 4200)
GC (Bendix 2100; Wilkins A-90)
Beckman Electroscan-30

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes
Total journal subscriptions? 23 Computer literature search service? No
Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 23.

4. Computer facilities: Department: terminal access (Hazeltine 1500; DEC Writer II, LA36) to PDP-11-70); Campus: IBM 1130 computer with online plotter.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approximately $3,000/year for chemicals and glassware; $1,500/ year for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

NSF-URP, $7,200.

3. Faculty teaching loads: Contact hours 12 Load credit for research? No

4. Sabbatical or leave support for research:

Sabbatical at 50% salary full year or full salary for 1/2 year every seventh year.

FACULTY PROFILE

AULT, ADDISON (b. 1933) Professor. B.A., 1955, Amherst College; Ph.D., 1960, Harvard University. *Organic Chemistry*. Stereochemistry, nuclear magnetic resonance spectrometry, enzyme kinetics, phase transfer catalysis, laboratory experiments for undergraduate organic chemistry.

Eight publications, 1973-1978.

A. Ault, *Techniques and Experiments for Organic Chemistry*, 3rd edition, Allyn and Bacon, 1979.

A. Ault, Selectivity and Specificity in Organic Chemistry, J. Chem. Educ. *54* 614 (1977).

A. Ault and G. O. Dudek, *An Introduction to Proton Nuclear Magnetic Resonance Spectroscopy*, Holden-Day, 1976.

A. Ault and *B. Wright, 2,2-Dichlorobicyclo[4.1.0]-heptane by Phase-Transfer Catalysis, J. Chem. Educ. *53* 489 (1976).

A. Ault, An Introduction to Enzyme Kinetics, J. Chem. Educ. *51* 381 (1974).

DESKIN, WILLIAM A. (b. 1924) Professor and Chairman. B.A. and B.S. in Ed., 1948, Northeast Missouri State University; M.A., 1950, University of Missouri; Ph.D., 1950, University of Iowa. *Inorganic Chemistry*, *Analytical Chemistry*. Transition metal complexes with sulfur containing ligands.

W. A. Deskin, *J. Worcester, *R. Cell, and *G. Lord, Formation Constants for Dithiooxalate Complexes, Proc. Iowa Acad. Sci., *82* 156 (1976).

W. A. Deskin, and *G. Lord, Ionization Constants for Ethylenediamine, Proc. Iowa Acad. Sci., *82* 100 (1975).

JORDAN, TRUMAN H. (b. 1937) Professor. B.A., 1959, Albion College; M.A., 1962, Harvard University; Ph.D., 1964, Harvard University. *Physical Chemistry*. Inorganic chemistry and crystallography and their applications to dental chemistry.

*J. D. Babcock, *J. C. King, and T. H. Jordan, The Reactions of Stannous Fluoride and Hydroxyapatite, J. Dent. Res. (in press)

M. Mathew, L. W. Schroeder, and T. H. Jordan, The Crystal Structure of Anhydrous Stannous Phosphate, $Sn_3(PO_4)_2$, Acta Cryst. *B33*, 1812 (1977).

T. H. Jordan, L. W. Schroeder, B. Dickens, and W. E. Brown, Crystal Structure of Stannous Hydroxide Phosphate, A Reaction Product of Stannous Fluoride and Apatite, Inorganic Chemistry, *15* 1810 (1976).

B. Dickens, E. Prince, L. W. Schroeder, and T. H. Jordan, A Refinement of the Crystal Structure of $H_3PO_4 \cdot 1/2\ H_2O$ with Neutron Diffraction Data, Acta Cryst. *B30* 1470 (1974).

T. H. Jordan, B. Dickens, L. W. Schroeder, and W. E. Brown, The Crystal Structure of $Ca(BF_4)_2$, Acta Cryst. *B31* 669 (1975).

Grants active 1977-1978: National Institute of Dental Research, $14,847, The SnF_2-$Ca(OH)_2$-H_3PO_4-H_2O Reaction System.

ODOM, DANIEL G. (b. 1948) Assistant Professor. B.S., 1969, Tarlton State University; M.S., 1972, University of Houston; Ph.D., 1973, Unviersity of Houston. *Biophysics*. Synthesis of Biological Molecules under conditions approximating the primitive earth; chemical evolution; origin of life.

E. Stephen-Sherwood, D. G. Odom, and J. Oro, The Prebiotic Synthesis of Deoxythymidine Oligonucleotides, J. Mol. Evol., *3* 323 (1974).

D. G. Odom and J T. Brady, The Prebiotic Synthesis of Deoxythymidine Oligonucleotides II. Comparison of Condensing Agents, J. Mol. Evol., *6* 199 (1975).

D. G. Odom, J. T. Brady, and J. Oro, The Prebiotic Synthesis of Oligonucleotides III. Acid Salt Reactions, J. Mol. Evol. *7* 151 (1976).

CREIGHTON UNIVERSITY

Omaha, NE 68178

Fall 1978 ug enrollment 3171

Degrees offered B.A., B.S., M.S.

Telephone 402-449-2814

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 38 Grad. school 9 Industry 5 Professional schools 22 Other 2 .
4. Senior majors, average past five years: 33 .
5. Students involved in research, average past five years: Acad. yr. 21 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,000 % used for teaching 70 % Research 30%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

Gouy magnetic susceptibility balance (Alpha 6000)
IR (PE 621)
AA (PE 370)
ur-vis-near IR (Cary 14)
NMR (Varian T60)
GC (Beckman 72-5)
GC (HP5750)
Polarograph system (Heath EUA-19)
x-y recorder (Houston Omni. 2000)
Universal Instrument (MP-1000)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 50 Computer literature search service? yes Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 10 .
4. Computer facilities: Department: Microcomputers, EL-MMD-1 and Commodore KIM-1; Campus: IBM 1130, and access to CDC 6400 through 16 time shared terminals.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   About $4,000 for supplies and $6,000 for equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   None

3. Faculty teaching loads: Contact hours 9 hrs Load credit for research? no
4. Sabbatical or leave support for research:

   Program under development expected to be operative in fall, 1979.

BAUMANN, DONALD J. (1915) Professor of Chemistry B.S., 1974, University of Detroit, M.S., 1944, Creighton University, Ph.D., 1952, Iowa State University. *Inorganic Chemistry*. Environmental Chemistry and Alternate Energy Sources.

DAVIES, MARCIA CORDES (1938) Associate Professor. B.A., 1961, Duchesne College, Ph.D., 1966, University of Notre Dame. *Inorganic Chemistry*. Characterization of Coordination Compounds by Physical Methods.

Y. Saito, C.W. Schlapfer, M. Cordes and K. Nakamoto, Metal Isotope Effect on Metal-Ligand Vibrations. IX. Far Infrared Spectra of Octahedral Nickel Halide Complexes of Pyridine and γ-Picoline, Applied *Spectroscopy* *27*, 213-217 (1973).

KLEIN, FRANCIS M. (1941) Associate Professor, B.S., 1963, King's College, Ph.D., 1976, University of Notre Dame. *Physical Organic Chemistry*. Mechanistic Organic Photochemistry, Computer Modeling of Chemical Reactions.

MATTSON, BRUCE M. (1951) Assistant Professor, B.A., 1973, Southwest State University, Ph.D., 1977, University of Minnesota. *Inorganic Chemistry*. Inorganic and Organometallic Photochemistry.

K. Given, B. Mattson, and L. Pignolet, Synthesis, Properties and X-Ray Structural Characterization of a Novel Seven-Coordinate Hylogeno-tris(dithiocarbamato) Complex of Ruthenium(IV), *Inorg. Chem.*, *15*, 3152 (1976).

B. Mattson and L. Pignolet, Synthesis and Characterization of a New Seven-Coordinate Ruthenium(IV) Complex. Crystal and Molecular Structure of Iodotris (N,N-dimethyldithiocarbamato) ruthenium(IV)-Iodine, *Inorg. Chem.*, *16*, 488 (1977).

K. Given, B. Mattson, G. Miessler, and L. Pignolet, Mass Spectrometry Data for Tris and Bis(N,N-dialkyldithiocarbamato) Complexes of Chromium, Iron, Cobalt, Ruthenium, Rhodium, and Thallium, *Inorg., Nucl. Chem.*, *39* 1309 (1977)

K.W. Given, B. Mattson, M.F. McGuiggen, G. Miessler, and L.H. Pignolet, Photochemical Reaction Pathways of Ruthenium(III) Complexes. Ultraviolet Irradiation of Tris(N,N-dialkyldithiocarbamato)-ruthenium(III)., *J.Am.Chem.Soc.*, *99*, 4855(1977).

S. Wheeler, B. Mattson, and L.H. Pignolet, Electrochemical and Chemical Properties of Ditniocarbamato Complexes of Ruthenium(II), (III), and (IV)., *Inorg. Chem.*, *17*, 0000 (1978).

OLSEN, ROBERT J. (1948) Assistant Professor, B.S., 1970, University of Wisconsin-Superior, Ph.D., 1976, University of Iowa. *Organic Chemistry*. Mechanistic organic photochemistry. Applications of photochemical reactions to the synthesis of compounds of medicinal and biological interest.

SHEARER, GREG OTIS (1947) Assistant Professor. B.S., 1969, Iowa State University, M.S., 1971, Creighton University, Ph.D., 1976, University of Kansas. *Physical Organic Chemistry*. Mechanisms of Organic and Biochemical Reactions.

R.P. Hanzlik and G.O. Shearer, Transition State Structure for Peracid Epoxidation. Secondary Deuterium Isotope Effects," *J. Amer. Chem. Soc.*, *97*, 5231 (1975).

R.P. Hanzlik and G.O. Shearer, Secondary Deuterium Isotope Effects on Olefin Epoxidation by Cytochrome P-450, *Biochem. Pharmacol.*, *27*, 1441 (1978).

SHEARER, GREG O., cont'd

R.P. Hanzlik, G.O. Shearer, A. Hamburg, and T.Gillisse, Metabolism in Vitro of Para-Substituted Styrenes. Kinetic Observations of Substituent Effects, Biochem. Pharmacol., 27, 1435 (1978).

SNIPP, ROBERT L. (1936) Associate Professor. B.S., 1958, Creighton University M.S., 1960 Creighton University, Ph.D., 1965, University of Iowa. Physical Chemistry. Physical Chemistry of Macro-molecules.

SOLSKY, JOSEPH F. (1949) Assistant Professor. B.A., 1971, State University of New York at Buffalo, Ph.D., 1977, State University of New York at Buffalo. Analytical Chemistry. Stationary Phases and Separations Techniques in Gas Chromatography.

E. Grushka and J. Solsky, p-Azoxyanisole Liquid Crystal as a Stationary Phase for capillary Column Gas Chromatography, Anal. Chem., 45, 1836 (1973)

P. Schnipelsky, J. Solsky, and E. Grushka, An Automatic Sequencer for Chromotographic Injections and Controls, J. Chromatog. Sci., 12, 45 (1974)

J.F. Solsky and Eli Grushka, Vapor Pressure Measurements of 4,4'-Dimethoxyazoxybenzene, J. Phys. Chem., 78, 275 (1974)

Eli Grushka and J.F. Solsky, The Behavior of p-(p-Ethoxyphenylazo)Phenyl Undecylenate (EPAPU) Liquid Crystal as a Chromatographic Liquid Phase Coated on Glass Beads, J. Chromatog., 99, 135 (1974)

Eli Grushka and J.F. Solsky, Solid Support Surface Effects on the Chromatographic Behavior of a Liquid Crystal Stationary Phase, J. Chromatog., 112, 145 (1975)

TAKEMURA, K.H. (1921) Professor of Chemistry. B.S., 1947, University of California - Los Angeles, M.S., 1948, University of Illinois - Urbana, Ph.D., 1950, University of Illinois, Urbana. Organic Chemistry, Reaction Mechanism and Synthesis.

ZEBOLSKY, DONALD M. (1933) Associate Professor and Chairman. B.A., 1956, Northwestern University, Ph.D., 1963, Kansas State University. Physical Chemistry, Modeling Ion Pairs and Complexes in Solution.

H.F. Friedman and D.M. Zebolsky, Calculated x-ray Scattering Functions for Aqueous Ph_4AsCl Which Fit the Osmotic Coefficient Data, J. of Solution Chemistry, 5, 853-865 (1976).

Coauthored by eighteen summer faculty fellows under the direction of Dr. Reg Vachon. The Meaning of Energy Growth: An assessment of systems, technologies, and requirements. MEGASTAR. NASA CR-120338. NASA, September 1974.

GROSS, STANLEY (1931) Instructor. B.S., 1956, Creighton University, M.S., 1958, Creighton University. Analytical Chemistry. Unique Methods of Classical Analysis.

DAVIDSON COLLEGE

Davidson, North Carolina 28036

Fall 1978 ug enrollment 1300

Degrees offered B.S.

Telephone (704)-892-2000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2. Support staff: FTE's secretary 3/4 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 8 Grad. school 4 Industry 1 Professional schools 2 Other 1 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 12 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 23,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR-60 MHz (Varian EM-360)
   UV-VIS - (Varian - Cary 14, Beckman DB)
   IR - (PE 283, 710, 700)
   GC - (H-P 5710A (2), Varian 90P)
   AA - (P-E 303)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 33 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 15 .
4. Computer facilities: Department: H-P 9820A, teletype terminal
   Campus: PDP-8 with 8 terminals, NCR Century 101

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   N/A

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   N/A

3. Faculty teaching loads: Contact hours 15 Load credit for research? NONE
4. Sabbatical or leave support for research:

   After every seven years, a one term sabbatical at full salary, 2 terms at 2/3 salary or 3 terms at 1/2 salary.

FACULTY PROFILE

BRYAN, H. ALDEN (b. 1928) Professor. A.B., 1950, King College, Ph.D., 1955, University of Tennessee. Analytical and Inorganic Chemistry. Synthesis and separation of platinum complexes.

H. Alden Bryan, Nantelle S. Pantaleo, W. Lawrence Dickinson, and Ronald C. Johnson, Reaction of Azide Ion with trans-Dichlorotetraamineplatinum (IV) Cations. Synthesis of Chloroazidotetraamineplatinum (IV) Salts. Inorganic Chemistry, 14, 1366(1975).

BURNETT, J. NICHOLAS (b. 1939) Associate Professor and Chairman. A.B., 1961, Emory University, M.S., 1963, Emory University, Ph.D., 1965, Emory University. Analytical Chemistry. Electrochemistry of organic and biological compounds.

R. W. Wightman, R. L. Scott, C. N. Reilley, Royce W. Murray and J. N. Burnett, Computer Controlled Rapid Scanning Stop Flow Spectrometer, Analytical Chemistry, 46, 1492(1974).

R. W. Wightman, J. R. Cockrell, R. W. Murray, J. N. Burnett and S. B. Jones*, Protonation Kinetics and Mechanism for 1,8-Dihydroxy-anthraquinone and Anthraquinone Anion Radicals in Dimethylformamide Solvent, J. Amer. Chem. Soc., 98, 2562(1976).

CARROLL, FELIX A. (b. 1947) Assistant Professor. B.S., 1969, University of North Carolina at Chapel Hill, Ph.D., 1973, California Institute of Technology. Organic Chemistry. Photochemistry, phase transfer catalysis, synthesis of pheromones.

Ten publications, 1973-1978.

F. A. Carroll, M. T. McCall and G. S. Hammond, The Role of Charge Transfer Interactions in the Quenching of 1,4-Dimethoxybenzene Fluorescence, J. Amer. Chem. Soc., 95, 315(1973).

A. C. Barefoot* and F. A. Carroll, Pyrolysis of Phenyl 2,2,2-Trideuterioacetate. Evidence Against a Concerted Mechanism, J. Chem. Soc., Chem. Commun., 357(1974).

D. G. Whitten, J. K. Roy and F. A. Carroll, Spectroscopic Studies of Non-luminescent Exciplexes. Electron Transfer and Exciplex Formation from Triplet States of Anthracene and Metalloporphyrins, in "The Exciplex," M. Gordon and W. R. Ware, Eds., Academic Press, New York, 1975, pp. 247-274.

F. A. Carroll and F. H. Quina, A New Method for the Determination of Intersystem Crossing Quantum Yields. Application to Benzene and its Methyl Derivatives. J. Amer. Chem. Soc., 98, 1(1976).

F. A. Carroll, Some Applications and Limitations of Heavy Atom Methods for the Determination of Photochemical Reaction Multiplicity, Mol. Photochem., 8, 133(1977).

Research grants active 1977-78: Research Corporation Cottrell College Science Grant, $12,360, Reactions of Organometallic Reagents with Intermediates in Photochemical Transformations; North Carolina Science and Technology Committee, $6,700, Synthesis and Testing of Insect Attractants.

FREDERICKSEN, JAMES MONROE (b. 1919) Professor. B.S., 1940, University of Richmond, Ph.D., 1947, University of Virginia. Organic Chemistry. Medicinal chemistry.

GABLE, RALPH WILLIAM (b. 1929) Associate Professor. B.S., 1950, University of Texas, M.A., 1953, Duke University, Ph.D., 1956, Duke University. Physical Chemistry. Water and ion exchange resins.

GARRETT, BENJAMIN C. (b. 1949) Visiting Assistant Professor. B.S., 1971 Davidson College, M.S., Ph.D., 1975, Emory University. Analytical Chemistry. Atomic absorption and emission spectroscopy; elemental analysis.

B. C. Garrett and A. L. Underwood, Application of Gas-Liquid Chromatography to Phenol Oxidase Studies, Anal. Biochem., 78, 132-138(1977).

NUTT, WILLIAM RODGER (b. 1943) Associate Professor. B.A., 1965, Ohio Wesleyan University, M.A., 1969, Duke University, Ph.D., 1971, Duke University. Inorganic and Physical Chemistry. Synthesis and characterization of gallium-nitrogen compounds.

B. F. Spielvogel, W. R. Nutt and R. A. Izydore, Correlations Between Carbon-13 and Boron-11 Chemical Shifts. IV. Carbenium Ions and their Trigonal Boron Analogs, J. Amer. Chem. Soc., 97, 1609(1975).

J. A. Dilts and W. R. Nutt, Sodium and Potassium Tetrahydrogallate, Inorganic Synthesis, Vol. XVI (1975).

Grants active 1977-78: Petroleum Research Fund, Type G, $9,000, Synthesis of Gallium-Nitrogen Compounds.

SCHUH, MERLYN D. (b. 1945) Assistant Professor. B.A., 1967, University of South Dakota, Ph.D., 1971, Indiana University. Physical and Biochemistry. Gas phase photochemistry and globular proteins in solution.

M. D. Schuh, *H. M. Sporborg and *K. E. Williams, Quenching of the Lowest Benzene Triplet State in the Vapor Phase by Nitric Oxide, Chem. Phys. Letters, 26, 541(1974).

*J. M. Burk, M. D. Schuh and *H. M. Sporborg, Mechanism for Quenching of Singlet State p-Xylene Vapor by Nitric Oxide, J. Chem. Phys., 63, 3567(1975).

Alberto M. Garcia, W. R. Ware, C. S. Parmenter, K. Y. Tong and M. D. Schuh, New SVL Lifetimes and Quantum Yields in Benzene Vapor: A Comparison of Experimental and Theoretical Radiative Transition Probabilities, Chem. Phys., 17, 377(1976).

M. D. Schuh, Search for Steric Hindrance to Quenching of Triplet State Alkylbenzene Vapors by cis-Piperylene and Biacetyl, J. Phys. Chem., 82, 1861(1978).

Grants active 1978-1980: Petroleum Research Fund, Type B, $13,000, Vapor Phase Triplet Studies.

UNIVERSITY OF DAYTON

Dayton, OH 45469

Fall 1978 ug enrollment 6641

Degrees offered B.S., B.A.

Telephone 513-229-2631

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9 . 2.Support staff: FTE's secretary 1 Stockrm 2 Technician 1
3. 1978 seniors & their placement: Total 3 Grad. school 1 Industry 0 Professional schools 2 Other ______.
4. Senior majors, average past five years: 22 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 79,000 % used for teaching 81% Research 19%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

   Infrared Perkin-Elmer Model 283 (1976)
   Atomic Absorption Perkin-Elmer 360 (1975)
   NMR P-E Model R-24 with Double Resonance (1976) and varian A60D
   Mass Spectrometer Bendix TOF Model 1073
   UV-VIS Spectrometers, P-E Model 124 + Beckman DB
   Ultracentrifuge, Beckman Model L-5-6S
   Liq. Scint Counter Intertechnique SL-30

3. Library resources: Chem. abstracts? YES Volume indices? YES Collected indices? YES Total journal subscriptions? 52 Computer literature search service? YES Separate chemistry or science library? NO Librarian? NO Standing orders for review series and annual reviews (past five years) 7 .
4. Computer facilities:

   UNIVAC SERIES 7, FORMERLY RCA SPEC 70

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   $4000/yr. chemicals and glassware, $5000/yr. for equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 6 Load credit for research? ______
4. Sabbatical or leave support for research:

   Sabbatical leave at 100% support awarded on individual request basis

CHUDD, CLETUS C. (b. 1911) Professor. B.S., 1935, University of Dayton, Ph.D., 1952, Western Reserve University. Analytical and Organic Chemistry.
Research Interests: In recent years my research interests have involved undergraduate students especially senior B.S. Chemistry majors doing a "Senior Thesis" for academic credit. Problems assigned are generally in the area of IR Spectroscopy, NMR Spectroscopy or non-aqueous quantitative titrations.

Two publications - no recent ones.

EVESLAGE, SYLVESTER L. (b. 1923) Professor. B.S., 1944, University of Notre Dame, Ph.D., 1953, University of Notre Dame. Analytical, General and Organic Chemistry.
Research Interests: Application of analytical methods in development of new clinical laboratory tests.

Five publications - no recent ones.

FOX, B. LAWRENCE (b. 1940) Associate Professor. B.S., 1962, John Carroll University, Ph.D., 1966, Ohio State University. Organic Chemistry.
Research Interests: Development and application of chromatographic and spectroscopic techniques in organic chemistry, forensic chemistry, toxicology, bioorganic chemistry.

Four Publications (1973-1978) - total of Fourteen

B.L. Fox and R.J. Doll, "A Mechanistic Study of the Reaction of Lithium Aluminum Hydride with N-Methylbenzanilides," J. Org. Chem., 38, 1136 (1973).

K. Fairlie* & B.L. Fox, Rapid Quantitative Determination of Tetrahydrocannabinol in Marihuana by Gas Chromatography, J. of Chromatographic Science, 14, 334 (1976).

B. Larsen, B.L. Fox, M.F. Burke & V.J. Hruby, The Separation of Peptide Hormone Diastereomers by Reverse Phase High Pressure Liquid Chromatography. Factors Affecting Separation of Oxytocin and its Diastereomers - Structural Information , International Journal of Peptide and Protein Research, In Press.

N.L. Hecht, D.S. Duvall, B.L. Fox, "Investigation of Advanced Thermal-Chemical Concepts for Obtaining Improved MSW-Derived Products", U.S. Environmental Protection Agency, Cincinnati, In Press.

Grants Active: Investigation of Advanced Thermal-Chemical Concepts for Obtaining Improved MSW-Derviced Products, U.S. Environmental Protection Agency (1977-1978) $188,000.

FRATINI, ALBERT V. (b. 1939) Associate Professor. B.S., 1960, University of Rhode Island, Ph.D., 1965, Yale University. Physical and General Chemistry.
Research Interests: Structure determinations employing x-ray diffraction methods have been carried out on a variety of inorganic and organic systems. The relationship between microscopic structure and properties in aromatic heterocyclic polymers is also under investigation.

Five Publications (1973-1978) - total of Twelve

C.M. Shaw, A.V. Fratini and W.W. Adams, "The Stereochemistry and Structure of the Solution Photodimer of 3-Phenyl-2-Cyclopentenone," Acta Cryst., B30, 1667 (1974).

W.R. Clayton, A.V. Fratini, R. Remmel and S.G. Shore, "2,6-Lutidinechloroborane, $C_7H_9N \cdot BH_2Cl$," Cryst. Structure Comm., 3 151 (1974).

A.V. Fratini, M.L. Denniston, R. Hertz, G.W. Sullivan* and S.G. Shore, "The Static Structure of the Fluxional Molecule $B_5H_9[P(CH_3)_3]_2$, an Isoelectronic Analog of $B_5H_{11}^{2-}$," J. Am. Chem. Soc., 96, 3013 (1974).

H. Rosenberg, T. Tsai, W.W. Adams, M.T. Gehatia, A.V. Fratini and D.R. Wiff, "The Synthesis and Structure of a Dispirotetrasilazane," J. Am. Chem. Soc., 98, 8083 (1976)

W.W. Adams, A.V. Fratini and D.R. Wiff, "N,N'-Dibenzoyl-p-phenylenediamine", Acta. Cryst., B34, 954 (1978).

KEIL, GERALD R. (b. 1941) Associate Professor. B.S., 1963, Villanova University, Ph.D., 1967, Temple University. Physical and Analytical.
Research Interests: Dr. Keil's research centers upon interfacial processes at boundaries. Spectroscopic techniques and model simulation are employed to study physical systems. The results of the research has quantitative analytical application to materials likely to be present in extremely small quantities. The study of anodic oxide films and the orientation of molecules adsorbed to their surfaces is a continuing avenue of investigation.

Three Publications (1973-1978) - total of Eight

"On the Anodic Oxidation of Molybdenum," C.M. Daly and R.G. Keil, Journal of the Electrochemical Society, 122, #3, p 350-3(1975).

"A Study of the Anodization of Niobium Using the Method of Open-Circuit Transients in Aqueous and Nonazueous Solutions," by C.M. Daly and R.G. Keil, Journal of the Electrochemical Society, 122, #6, 730-3 (1975).

"Inelastic Electron Tunneling Spectroscopy: A Review of an Emerging Analytical Techniques," by R.G. Keil, T.P. Graham, and K.P. Roenker, Applied Spectroscopy, 30, #1, 1976.

KNACHEL, HOWARD C. (b. 1940) Associate Professor. B.S. 1963, University of Dayton, Ph.D., 1971, Ohio State University. General, Inorganic and Analytical Chemistry.
Research Interests: Dr. Knachel is presently involved in the synthesis and structural characterization of compounds formed from PCl_5 and a variety of Lewis bases. The research utilizes vacuum line and glove box techniques for handling moisture sensitive materials. Methods include elemental analysis, molecular weight determinations, NMR, and x-ray diffraction.

Two publications (1973-1978)

R.W. Suter, H.C. Knachel, V.P. Petro, J.H. Howatson and S.G. Shore, "Nature of Phosphorus (V) Chloride in Ionizing and Nonionizing Solvents". J. Am. Chem. Soc., 95, 1474 (1973).

H.C. Knachel, and J.N. Ishley, "Phosphorus (V) Chloride-Pyrazine Addition Compound." Inorganic Chem., 14, 2558 (1975).

LUCIER, JOHN J. (b. 1917) Professor and Chairman. B.S. 1937, University of Dayton, Ph.D., 1951, Western Reserve University. Organic Chemistry.
Research Interests: Organic Synthesis, Infrared Spectroscopy.

Ten publications - no recent ones.

MICHAELIS, CARL I. (b. 1918) Professor. B.A. 1945, University of Kansas, Ph.D. 1953, University of Florida. General and Organic Chemistry.
Research Interests: Continued advising of large numbers of Premedical students and advisor to the Premedical Honor Society. Continued as advisor to the Student Chapter of the American Chemical Society and advisor to Chemistry majors.

Three publications - no recent ones.

SINGER, SANFORD S. (b. 1940) Associate Professor. B.S. 1962, Brooklyn College, MS. 1964, University of Michigan. Biochemistry, Ph.D., 1967 University of Michigan, Biochemistry.
Research Interests: Mode of action of adrenal glucocorticoids in physiologic and pathologic actions of glucocorticoids; and in diseases like hypertension, cancer and aging. Study of steroid sulfotransferases and other glucocorticoid metabolizing enzymes .. Enzymology and enzyme purification.

Five Publications (1973-1978) - total of Twenty

Singer, S.S., D. Giera, J. Johnson, and S. Sylvester, "Enzymatic Sulfation of Steroids: 1. The Enzymatic Basis for the Sex Difference in Cortisol Sulfation by Rat Liver Preparations," Endocrinology, 98: 963-973(1976).

SINGER, SANFORD S., cont'd

Singer, S.S., and S. Sylvester, "Enzymatic Sulfation of Steroids: 2. Control of the Hepatic Cortisol Sulfotransferase Activity and of The Individual Cortisol Sulfotransferases of Rats by Gonads and Gonadal Hormones." Endocrinology, 99: 1356-1362(1976).

Singer, S.S., E. Hess, and S. Sylvester, "Hepatic Cortisol Sulfotransferase Activity in Several Types of Experimental Hypertension in Male Rats," Biochem. Pharmacol., 26: 1033-1038 (1977).

Singer, S.S., Enzymatic Sulfation of Steroids: 3., "Sulfation of Corticosterone by the Glucocorticoid Sulfotransferases of Rat Liver Cytosol," Biochim. Biophys. Acta, 539: 19-31(1978).

Singer, S.S., Enzymatic Sulfation of Steroids: 4. Control of Hepatic Glucocorticoid Sulfotransferase Activity and Individual Glucocorticoid Sulfotransferases from Male and Female Rats by Adrenals and Corticosteroids," Endocrinology, 103: 66-73(1978).

Active Research Grant: Study of "STEROID SULFOTRANSFERASES AND GLUCOCORTICOID ACTION" funded for $125,000 for Aug. 1977-Sept. 1980 by National Institute of Arthritis, Metabolim, and Digestive Diseases.

DENISON UNIVERSITY
GRANVILLE, OHIO 43023

Fall 1978 ug enrollment 2100
Degrees offered B.A., B.S.
Telephone (614) 587-0810

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7. 2. Support staff: FTE's secretary 3/4 Stockrm 1 3/8 Technician 0
3. 1978 seniors & their placement: Total 18 Grad. school 7 Industry 1 Professional schools 5 Other 5.
4. Senior majors, average past five years: 16.
5. Students involved in research, average past five years: Acad. yr. 5 Summer 1-2
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 23,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR-(Varian T-60)
UV-VIS (Cary 118, Beckman DU & P-E 55B)
IR (Beckman IR-20A & IR-33)
GC (H-P 5700A)
Polarimeter (Rudolph Model 63)
Electrophoresis (Savant FP-22A)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 16 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 12.
4. Computer facilities: DEC PDP 11/45 Time sharing, 30 terminals; 2 in Chemistry Building

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $3000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: none currently
3. Faculty teaching loads: Contact hours 12-13 Load credit for research? no
4. Sabbatical or leave support for research: Sabbatical every seven years at 1/2 salary for full year or full salary for 1/2 year. Faculty Development program support for summer research.

BROWN, JOHN B. (b.1924) Professor. B.S., 1948, Univ. of Kentucky; Ph.D., 1956, Northwestern Univ. Physical Chemistry. Micellar catalysis, solubilization by cationic detergents.

J. B. Brown, I.Lapczynska and S. Friberg, Microemulsions using nonionic emulsifiers, Proc. Int. Conf. Colloid Surf. Sci., 1, 507-515 (1975).

M. N. Yudenfreund, P. Becher and J. B. Brown, Protein-surfactant interactions. I. Effects of surfactants upon gliadin monolayers at the air-aqueous interface. Paper No. 14 in Monolayers, ed. by E. D. Goddard, ACS Adv. Chem. Series. 144, 192-201 (1975).

DOYLE, RICHARD R. (b.1937) Associate Professor and chairman. B.S., 1960, Drexel Institute of Technology, M.S. 1963, Ph.D. 1965, University of Michigan, Organic and Biological Chemistry. Amino Acid Synthesis, Mushroom Chemistry.

R. R. Doyle and B. Levenberg, L-3-(3-Carboxyfuran-4-yl) Alanine, a New Amino Acid from the Mushroom *Phyllotopsis nidulans*. Phytochem. 13, 2813-14(1974).

EVANS, THOMAS A. (b. 1942) Associate Professor. A.B., 1964, Grinnell College, Ph.D., 1968, Michigan State University, Organic Chemistry. Ferrocene chemistry and biochemistry, porphyrin chemistry, steric effects in organic reactions.

Thomas A. Evans and Joseph J. Katz, "Evidence for 5- and 6- coordinated magnesium in Bacteriochlorophyll a from Visible Absorption Spectroscopy," Biochim. Biophys. Acta, 396, 414 (1975).

Thomas A. Evans, "The Impact of Chemical Science: Do Our Students Understand It?" J. Chem. Educ. 54, 304 (1977).

GALLOWAY, GORDON L. (b.1936) Professor. B.S., 1957, Franklin and Marshall College, Ph.D., 1962, Michigan State University. Inorganic Chemistry. The chemistry of 8-methoxypsoralen; educational uses of the computer.

G. L. Galloway, "What Business Has a Chemist Teaching 'Science and Human Values'?", J. Chem. Educ., 54, 84 (1977).

G. L. Galloway, "Who, Me Teach Human Values?", Chemtech, Vol. VII (No. 12), 725 (1977).

GILBERT, GEORGE L. (b. 1933) Professor. B.S., 1958, Antioch College, Ph.D., 1963, Michigan State University. Inorganic Chemistry, Chemical Education. Coordination Compounds of Platinum and Other d-block Elements; Demonstrations in Chemical Education.

G. L. Gilbert, D. Kliger, and E. Switkes, A PSI Guide for Chemical Principles, W. A. Benjamin, Inc., 1973.

G. L. Gilbert, Self-Pacing: Evangelism and Effectiveness, Proceedings of the Symposium on Self-Paced Instruction in Chemistry, B. Z. Shakhashiri Ed., 1973.

R. K. Wismer and G. L. Gilbert, Computers and Simulation in Chemical Education, Simulation in Higher Education, Exposition Press, 1978.

Editor, Tested Demonstrations Feature, Journal of Chemical Education, 1976 to present.

HOFFMAN, WILLIAM A., JR., (b. 1928) Professor. B.S., 1950, Missouri Valley College, M.S., 1952, Ph.D., 1955, Purdue University. Analytical Chemistry. Solution Chemistry.

W. A. Hoffman, Jr., Compact, Variable Volume, Liquid/Liquid Extractor, Anal. Chem., 50, 2158-59 (1978).

SPESSARD, DWIGHT R. (b. 1919) Wickenden Professor of Chemistry. B.S., 1941, Otterbein College, Ph.D., 1944, Western Reserve University. Organic Chemistry. Organo-phosphorus chemistry.

DORDT COLLEGE
Sioux Center, IA 51250

Fall 1978 ug enrollment 1225
Degrees offered A.B.
Telephone (712) 722-3771

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 2 . 2. Support staff: FTE's secretary 0 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 1 Grad. school ______ Industry ______ Professional schools 1 Other ______.
4. Senior majors, average past five years: 2 .
5. Students involved in research, average past five years: Acad. yr. 1 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 8000 % used for teaching 90 Research 10
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

GC (Varian Series 1200)
GC (Varian A-90-P)
AA (Beckman 440)
UV (Beckman DB-G)
IR (Beckman Microspec)
NMR and ESR (Cenco)
Polarograph (Sargent Model III)
Differential Catalytic Reactor (constructed)
Sorptometer (constructed)

3. Library resources: Chem. abstracts? Yes Volume indices? Some Collected indices? No Total journal subscriptions? 20 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 6 .
4. Computer facilities: Campus: Data General Nova 3.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approximately $1000

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

None

3. Faculty teaching loads: Contact hours 18 Load credit for research? No
4. Sabbatical or leave support for research: None

GEELS, EDWIN J. (b. 1940) Professor. B.S., 1961, Calvin College, Ph.D., 1965, Iowa State University. Organic Chemistry. Free radical reactions.

MAATMAN, RUSSELL W. (b.1923) Professor and Chairman. A.B., 1946, Calvin College, Ph.D., 1950, Michigan State University. Physical Chemistry. Heterogeneous catalysis, solution-surface reactions.

Six publications, 1973-1978

R. Maatman, *W. Ribbens, and *B. Vonk, The Role of Pd - Alumina Catalyst in the Dehydrogenation of Cyclohexane, J. Catal., 31, 384 (1973).

R. Maatman, *M. Poel, and *Paul Mahaffy, Composite Adsorption Isotherms corrected for solution - Adsorbate Molar Volume Differences, J. Colloid and Surf. Chem., 48, 134 (1974).

R. Maatman, *Peter Mahaffy, and *R. Mellema, n-Propanol-Acetic Acid Esterification Catalyzed by Silica Gel, J. Catal., 35, 44 (1974).

R. Maatman, Using the Calculated Site Density as a Criterion in Choosing a Catalytic Slow Step, J. Catal., 43, 1 (1976).

R. Maatman, *C. Friesema, *R. Mellema, and *J. Maatman, The Site Density Criterion and the Mechanism of n-Heptane Cracking over a Rare Earth Type X Sieve, J. Catal., 47, 62 (1977).

DRAKE UNIVERSITY

Des Moines, IA 50311

Fall 1978 ug enrollment 5,000

Degrees offered B.A., M.A.

Telephone (515) 271-2174

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2. Support staff: FTE's secretary 1 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 10 Grad. school 2 Industry 2 Professional schools 4 Other 2 .
4. Senior majors, average past five years: 7 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,700 % used for teaching 85 Research 15
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   - NMR: Varian T-60-A
   - IR: Beckman IR 8, IR 33
   - Spectrophotofluorometer: Aminco-Bowman
   - UV-VIS: Beckman DK-2A
   - Polarograph: Sargent Welch Model XVI
   - AA: Varian Techtron Model Model 1200
   - GC: Aerograph HY-FI 600-D, Aerograph A-90-P
   - Conductivity Bridge: Industrial Instruments RC-18
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 54 Computer literature search service? Yes Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 21 .
4. Computer facilities:
   Campus: CDC-6400
   Department: Two terminals for CDC-6400, no internal charges for computer use

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approximately 1,000/yr chemicals and glassware
   Approximately 800/yr equipment
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Research Corporation, $24,000
3. Faculty teaching loads: Contact hours 15 Load credit for research? Negotiable
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary half year. Frequency averages every 7 years.

BROWN, LAWRENCE E. (b. 1940) Associate Professor and Chairman. B.S., 1962, University of Dayton, M.S., 1966, Ph.D., 1973, The Pennsylvania State University. Bio-organic Chemistry. Applications of fluorescent probes in enzyme and membrane studies. Photosensitized singlet oxygen generation.

DOUGLASS, CHARLES H. Jr., (b. 1949) Assistant Professor. B.A., 1971, University of the South, Ph.D., 1975, University of Minnesota. Physical Chemistry. Atmospheric chemistry, chemical education. Eight publications, 1973-78.

C.H. Douglass, D.J. McClure and W.R. Gentry. The Dynamics of the Reaction, $H_2^+ + H_2 \rightarrow H_3^+ + H$, with Isotopic Variations; J. Chem. Phys., 67, 4931(1977).

D.J. McClure, C.H. Douglass and W.R. Gentry, The Dynamics of the Reaction $D_2^+ + O(3P) \rightarrow OD^+ + D$, and the Influence of the Quadripole Moment on the Cross Section at Very Low Kinetic Energies, J. Chem. Phys., 67, 2362(1977).

D.J. McClure, C.H. Douglass, and W.R. Gentry, The Dynamics of the Reaction $D_2^+ + N \rightarrow ND^+ + D$. J. Chem. Phys., 66, 2079(1977).

C.H. Douglass, D.J. McClure, D.J. Trevor and W.R. Gentry, A Merged Beam Study of Isotopic Effects in the Reaction $H_2^+ + H_2 \rightarrow H_3^+ + H$, Electronic and Atomic Collisions, edited by J.S. Risley and R. Geballe (University of Washington Press, Seattle, 1975), IX ICPEAC, p. 584.

D.J. McClure, C.H. Douglass and W.R. Gentry, A Merged Beam Study of the Reaction $D_2^+ + O \rightarrow OD^+ + D$, Electronic and Atomic Collisions, edited by J.S. Risley and R. Geballe (University of Washington Press, Seattle, 1975). IX ICPEAC, p. 577.

FUNKE, LAWRENCE A. (b. 1949) Assistant Professor. B.S., 1971, University of Dayton, Ph. D., 1976, Michigan State University, Postdoctoral Fellow, 1976-1977, Northwestern University. Inorganic Chemistry. Transition metal coordination compounds, especially the reactions of compounds containing macrocydic ligands. Bio-inorganic chemistry, particularly the synthesis,characterization and reactions of compounds which may act as models for natural systems.

L.A. Funke and G.A. Melson, Dynamic Linkage Isomerization of 3,3'- Ethylenebis (nitrilomethylidyne) di-2,4-pentanedionato (2-) nickel, Inorg. Chem., 14, 306(1975).

HILLS, DIANE C. (b. 1942) Instructor. B.S., 1963, Iowa State University, M.S., 1966, Ph.D. (pending) 1980. Biochemistry. Studies of transfer RNA.

JACOB, F. EMMITT (b. 1910) Professor. B.A., 1932, University of Missouri, B.S., 1935, Ph.D., 1939. Physical and Analytical Chemistry. Electrochemistry, particularly equilibrium and kinetic studies. Spectroscopic methods.

LINDBERG, JAMES G.(b.1940) Professor.B.A.,1962,Kalamazoo College, Ph.D.,1969,Baylor University. Organic Chemistry. Nuclear magnetic resonance, steric & structural effects.

G.R. Parker, N.K. Hilgendorf* and J.G. Lindberg, Solvent Dependent Conformational System in Hydroxyureas Detected by NMR Spectroscopy, J. Pharm. Sci., 65, 585(1976).

J.G. Lindberg and A. Leong*, Quantitative Estimation of Steric Effects. Part III. Substituent Constants and Steric Contributions to the Chemical Shifts of Methyl Group Protons in Ring Iodinated Methylbenzenes, J. Mag. Res., 20, 89(1975).

J.G. Lindberg, G.Y. Sugiyama* and R. Mellgren*, Quantitative Estimation of Steric Effects Part II. Substituent Constants and Steric Contributions to the Chemical Shifts of Methyl Group Protons in Ring Brominated Methylbenzenes, J. Mag. Res., 17, 112(1975).

J.G. Lindberg, Academic Vitamins: The Development and Utility of Course Supplements, J. Chem. Ed., 52, 86(1975).

WOODS, JOE D. (b. 1923) Professor. B.A., 1947, Central College, M.S., 1950, Iowa State University, Ph.D., 1954. Inorganic Chemistry. Use of radioactive tracers in inorganic reaction mechs, oxidation of metals, thermal decomposition reactions of oxygen anions.

DREW UNIVERSITY

Madison, NJ 07940

Fall 1978 ug enrollment 1500

Degrees offered A.B.

Telephone (201) 377-3000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 1/3 Stockrm 5/6 Technician 0
3. 1978 seniors & their placement: Total 8 Grad. school 5 Industry 1 Professional schools 2 Other 0 .
4. Senior majors, average past five years: 10 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 0
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 9,000 % used for teaching 90% Research 10%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (JEOL JNM-PMX 60)
MS (CEC 21-614)
IR (PE 727 & Pye Unicam SP1025)
GC (F&M 720 & G-M 750)
LC (LDC & Haskell pumps; LDC & PE det)
UV/VIS (PE 202 & BL 600)
AA (Varian 1000)
Variable Wavelength Dye Laser

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? No Total journal subscriptions? 46 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 37 .
4. Computer facilities: H-P 3000

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   $1000 expendable supplies.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   Equipment grant; Frueauff Foundation; $10,000.
3. Faculty teaching loads: Contact hours 12 Load credit for research? occasional
4. Sabbatical or leave support for research:
   Sabbatical leaves at full salary for a semester or half-salary for a year. Chemistry faculty average every 7th year.

FEUER, BERNICE I. (b. 1942) Instructor. A.B., 1963, Douglass College, M.S., 1967, Stevens Institute of Technology. Ph.D. candidate 1979, Rutger-the-State-University. Biochemistry. Biochemistry of membranes using enveloped viruses as model systems.

B.I. Feuer, E.E. Uzgirus, R.W. DeBlois, D.W. Cluxton, and J. Lenard, Length of Glycoprotein Spikes of Vesicular Stomatitis Virus & Sindbis Virus, Measured in situ Using Quasi Elastic Light Scattering & a Resistive-Pulse Technique, Virology, 90, 156-61 (1978).

MILLER, JAMES M., (b. 1933) Professor and Chairman. B.S. 1955, Elizabethtown College, M.S., 1958 and Ph.D., 1960, Purdue University. Analytical Chemistry. Separation methods; gas and liquid chromatography; chromatographic detectors.

J.M. Miller and E. Tucker, Use of HPLC for Multicomponent Serum Analysis, American Laboratory, 11, Jan., (1979).

J.M. Miller, Gas Chromatographic Analysis of Aerosol Propellants, J. Chem. Educ. 54, 735 (1977).

A.E. Lawson, R. Mathieu, A.J.P. Martin, and J.M. Miller, Christiansen Effect Detector, U. S. Patent #4,042,304 (1977).

J.M. Miller, Separation Methods in Chemical Analysis, Wiley-Interscience, N.Y., 1975.

MORAN, WILLIAM J., (b. 1912) Adjunct Research Professor. B.S., 1934, Washington and Lee, M.S., 1940, and Ph.D., 1949, New York Polytechnic Institute. Organic Chemistry. Preparation of substituted indenes and other compounds of possible pharmacological activity. Dr. Moran is a retired industrial chemist, ½ time in [illegible] research.

NELSON, GREGORY V. (b. 1943) Associate Professor. B.A., 1965, St. Olaf College, Ph.D., 1968, University of California, Berkeley. Inorganic Chemistry. Molecular Symmetry and Group Theory; electron spin resonance spectroscopy; computer graphics; chemistry instructional materials; computer modelling; transition metal complexes.

Six publications, 1973-1978.

G.V. Nelson, Group Theory Tables in the Lecture Hall, J. of Chem. Educ., 50, 501 (1973).

G.V. Nelson, The Preparation and Projection of Inexpensive 35mm Three-Dimensional Slides, J. of Chem. Educ., 51, 47 (1974).

G.V. Nelson, Bonding, Structure and Spectroscopy, American Laboratory, 6, 11 (1974, March); International Laboratory, 6, 11 (1974, May/June).

G.V. Nelson, Stereoscopic Slides in Chemistry, (in four parts), The C. V. Mosby Company, (St. Louis, 1975).

G.V. Nelson and A. von Zelewsky, Aromatic Radical Anions in Neat Solvents: Crown Complex Ion-Pair Formation, J. Am. Chem. Soc., 97, 6279 (1975).

SCOTT, DONALD A. (b. 1917) Professor. A.B., 1939, Cornell College, M.S., 1941, University of Arizona, Ph.D., 1952, University of Iowa. Organic Chemistry. Natural products from bark, and hydrogen-deuterium exchange on carbon attached to sulfur.

SIEBERT, DONALD R. (b. 1946) Assistant Professor. B.S., 1968, Union College (NY), Ph.D., 1973, Columbia University. Physical Chemistry. Laser-assisted studies of molecular energy transfer and chemical reactions.

W.S.Drozdoski, R.D. Bates, Jr., and D.R. Siebert, Vibrational Energy Flow in CD_3H and CD_3H - Polyatomic Mixtures, J. Chem. Phys., 69, 863 (1978).

D.R. Siebert and G.W. Flynn, Mode to Mode Energy Transfer in OCS Directly Pumped by a CO_2 Laser, J. Chem. Phys., 64, 4973 (1976).

D.R. Siebert and G.W. Flynn, Vibration-Vibration Energy Transfer in Laser Excited SO_2: Further Evidence for a Slow V-V Step, J. Chem. Phys., 62, 1212 (1975).

D.R. Siebert, F.R. Grabines and G.W. Flynn, Time-Resolved Thermal Lensing Studies of Laser-Induced Translational Energy Fluctuations in CD_4, SO_2, and OCS, J. Chem. Phys., 60, 1564 (1974).

DRURY COLLEGE

Springfield, MO 65802

Fall 1978 ug enrollment 900

Degrees offered A.B., B.S.

Telephone (417) 865-8731

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2.Support staff: FTE's secretary 0 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 11 Grad. school 5 Industry 1 Professional schools 5 Other 0 .
4. Senior majors, average past five years: 10 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 8
6. National student honors, past five years (NSF fellowships, etc.)

American Institute of Chemists' Student Award Winners, 1975, 1976 and 1978.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 36,000 % used for teaching 85 Research 15
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR - 90 MHz (Varian EM300 Anaspect)
MS (VeeCo SDI-10 Monopole)
UV-Vis (Beckman DB and Beckman B)
AA (Varian 1000 Techtron with Model 63 Carbon Rod Atomizer)
Polarograph (Sargent FS)
GC (Barber-Colman 5340 Thermal Conductivity)
IR (P-E 700 and Beckman Microspec)
Electrophoresis (Beckman Model R)
Potentiometer (Leeds and Northrup K-3 and K-5)
Conductivity (YSI 31 Bridge)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 12 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 12 .

4. Computer facilities:
On campus: National Cash Register (NCR) Century 100; off campus at SMSU **International Business Machines (IBM) 370 with remote console** & high-speed printer

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approx. $5,000/yr for chemicals, equipment and glassware

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

3. Faculty teaching loads: Contact hours 15 Load credit for research? None

4. Sabbatical or leave support for research: **Faculty can apply for sabbatical leave at 50% salary for a full year, or full salary for ½ year, every seventh (7th) year**

GIBBONS, James J. (b.194[illegible]) Assistant Professor and Coordinator of Chemistry. A.B. cum laude, 1969, Drury College; Ph.D., 1974, Louisiana State University. Physical and Inorganic Chemistry. Ionization Constants of Ampholytes in Mixed Solvent Media, Ionic Equilibria in Mixed Solvents.

Thirty publications, 1973-1978

R.N. Roy, J.J. Gibbons, *G. LaCross, Jr. and *C.W. Krueger, Dissociation Constants of the Ampholyte Glycine in 50 Mass % Methanol-Water from 5 to 55°C, with Related Thermodynamic Quantities, J. Soln. Chem., 5 (5), 333 (1976).

R.N. Roy, J.J. Gibbons and *R. Snelling, Thermodynamics of the Dissociations of Glycine in 50 Mass % Aqueous Monoglyme from 5 to 55°C, J. Soln. Chem., 6 (7), 475 (1977).

R.N. Roy, J.J. Gibbons, *C. Krueger and *G. LaCross, Jr., Second-Stage Dissociation of N,N-Bis(2-Hydroxyethyl)-2-Aminoethanesulfonic Acid ("BES") in Water and in 50 Mass Per Cent Methanol + Water from 278.15 to 328.15 K, J. Chem. Thermo., 1977 (9), 325 (1977).

R. Sen and J.J. Gibbons, Ionic Equilibria in Mixed Solvents: Formation of Calcium [illegible], J. Chem. Eng. Data, 22 (3), 309 (1977).

R.N. Roy, J.J. Gibbons and *C. Tillman, Jr., Dissociation Constants of m-Nitroanilinium Ion in 1,2-Dimethoxyethane-Water Mixtures at 25°C by Spectrophotometric Measurements, Anal. Chim. Acta, 97, 207 (1978).

PADRON, Jorge L. (b.1931) Professor of Chemistry, Dean of the College and Vice President for Academic Affairs. B.S., 1952, Oklahoma Baptist University; M.S., 1954, Ph.D., 1956, University of Oklahoma. Organic and Biochemistry. Isolation and Identification of Natural Metabolites in Body Fluids.

Three publications, 1973-1978.

J.L. Padron, *D. Hunt and R.H. Lewis, Glucosamine Acetoacetate Condensate III: Its Effect Upon Serum Insulin Levels and Glucose Uptake by Muscle and Liver, Japan J. [illegible] Sci. Biol., 25 (2), 57 (1972).

J.L. Padron, J.T. Gallagher and P.J. Kent, Metabolically Active, Single Cell Preparation from the Mucosal Epithelium of Rabbit Small Intestine, The British Journal of Experimental Pathology, 54 (4), 347 (1973).

R.N. Roy, J.J. Gibbons, J.L. Padron, *K. Buechter and *S. Faszholz, Thermodynamic Study of Glycine in Different Tetrahydrofuran-Water Mixtures at Several Temperatures from 278.15 to 328.15 K, A.C.S. Advances in Chemistry Series, in press.

ROY, Rabindra N. (b.1939) Professor and Chairman, Department of Chemistry, Mathematics and Physics. B.Sc.(Honors), 1959, M.Sc.(Honors), 1961, Jadavpur Univ.; Ph.D., 1966, Louisiana State University. Physical and Analytical Chemistry. Ion-ion Interactions in Mixtures of Strong Electrolytes, Standard Buffers for Use in Biological Fluids.

Fifty publications, 1973-1978.

R.N. Roy, R.A. Robinson and R.G. Bates, Thermodynamics of the Two Dissociation Steps of N-Tris(Hydroxymethyl)Methylglycine ("Tricine") in Water from 5 to 50°C, J. Amer. Chem. Soc., 95, 8231 (1973).

R.N. Roy, *E.E. Swensson, *G. LaCross, Jr. and *C.W. Krueger, Standard Buffer of N,N-Bis(2-Hydroxyethyl)-2-Aminoethanesulfonic Acid (BES) for Use in the Physiological pH Range 6.6 to 7.4, Anal. Chem., 47, 1407 (1975).

R.N. Roy, *E.E. Swensson, *G. LaCross, Jr. and *C.W. Krueger, Thermodynamic Study of Hydrobromic Acid in Water-1,2-Dimethoxyethane (Monoglyme) from EMF Measurements, A.C.S. Advances in Chemistry Series, Volume 155, Thermodynamic Behavior of Electrolytes in Mixed Solvents, Chapter 13.

R.N. Roy, J.J. Gibbons, *R. Snelling, *J. Moeller and *T. White, The System HBr + $(Bu)_4NBr$ + H_2O at 25°C. Application of Pitzer's Equations, J. Phys. Chem., 81, 391 (1977).

K.S. Pitzer, R.N. Roy and L.F. Silvester, Thermodynamics of Electrolytes. 7. Sulfuric Acid, J. Amer. Chem. Soc., 99, 4930 (1977).

Grant, $14,000, American Chemical Society - Petroleum Research Fund.

EARLHAM COLLEGE
Richmond, Indiana 47374

Fall 1978 ug enrollment 950 FTE
Degrees offered A.B.
Telephone (317) 962-6561

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2.Support staff: FTE's secretary .75 Stockrm .5 Technician 0
3. 1978 seniors & their placement: Total 6 Grad. school 2 Industry 0 Professional schools 0 Other 2 .
4. Senior majors, average past five years: 9 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 13,500 % used for teaching 45% lab & classroom Research 12% lab
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

IR - (P.E. 457)
GC - (Aerograph 600-D)
NMR - (Varian EM300)
UV-VIS - (Beckman ACTAC111)
AA - (P.E. 503)
Conductivity - (L&N Jones Bridge)
Micro balance - (Ainsworth FDM)
Guoy balance
X-Ray Diffraction (Norelco)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 23* Computer literature search service? Yes** Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 15 .
4. Computer facilities: PDP 11/70 Timesharing TTY-ASR33 & DEC-LA36 in Chemistry PDP8e

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

College Professional Development Grants

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

duPont College Science Grant $6500

3. Faculty teaching loads: Contact hours 15 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply once every seven years for sabbatical leave at 50% salary full year and full salary for 1/3 year.

* Chemistry only (312 science, approx.) ** Through another nearby institution

FACULTY PROFILE

BAKKER, GERALD R. (b.1933) Professor and Chairman. A.B., 1955, Calvin College, Ph.D., 1959, University of Illinois. Organic Chemistry. Synthesis and structure determination of hindered aromatic acids. Philosophy of Science.

G.R. Bakker and J. Loewenherz*, Development of an Automatic Recording Apparatus for Gasometric Analysis at Constant Pressure, Indiana Acad. Sci., 83, 128(1973).

G.R. Bakker, J.B. Francis, C.B. Neff, and S.C. Scholl, Professional Development of Faculty, Criteria IV (1977).

G.R. Bakker and staff, A Program for Integrative Education, Change Report 6 on Teaching, 44(1978).

COPELAND, THOMAS G. (b.1948) Assistant Professor. A.B., 1970, Hamilton College, Ph.D., 1975, Brown University. Physical Chemistry. Dielectric Constants, Pair Interactions and Molecular Shape of Polar Molecules.

T.G. Copeland and R.H. Cole, Far Infrared Absorption and Quadrupole Moment of Nitrous Oxide, Chem. Phys. Letters, 21, 289(1973).

T.G. Copeland and D.J. Denny, Dielectric Relaxation in Supercooled n-Propyl Benzene, J. Phys. Chem., 80, 210(1976).

T.G. Copeland and R.H. Cole, Dielectric and Pressure Virial Coefficients of Imperfect Gases, VI, Analysis of Results for CF_3H and CFH_3, J. Chem. Phys., 64, 1741(1976).

T.G. Copeland and R.H. Cole, Dielectric and Pressure Virial Coefficients of Imperfect Gases, VII, CF_3H-Ar and CFH_3-Ar Mixtures, J. Chem. Phys., 64, 1747(1976).

STRATTON, WILMER J. (b.1932) Professor. A.B., 1954, Earlham College, Ph.D., 1958, Ohio State University. Inorganic Chemistry. Stereochemistry of Metal Coordination Compounds: Polydent[illegible] Chelate Compounds with Ligands Containing Aromatic Hydrazone and Azine Groups.

H.W. Smith and [illegible]. Stratton, Preparation, Properties and Molecular Structure of Ethylenediamine Tetracobatate(II) Chloride, $(NH_3CH_2CH_2NH_3)\ (CoCl_4)Cl_2$, Inorganic Chemistry, 16, 1640(1977).

STRONG, LAURENCE E. (b.1914) Professor. A.B., 1936, Kalamazoo College, Ph.D., 1940, Brown University. Physical Chemistry. Effect of Constitution on the Conductance of Electrolytes in Benzene.

L.E. Strong, Balancing Chemical Equations, Chemistry Magazine, 47, 13(1974).

L.E. Strong (Section Editor, R.L. Wolke General Ed.), Impact: Science on Society, W. B. Saunders, Philadelphia, 1975.

L.E. Strong, Stirrer for a Constant Temperature Bath, J. Chem. Educ., 53, 585 (1976).

G.A. Scherer and L.E. Strong, Regeneration of Mixed Bed Ion Exchange Columns, J. Chem. Educ., 55, 268(1978).

ELIZABETHTOWN COLLEGE

Elizabethtown, PA 17022

Fall 1978 ug enrollment 1422

Degrees offered B.S.

Telephone (717) 367-1151

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5½. 2. Support staff: FTE's secretary 3/4 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 18 Grad. school 0 Industry 1 Professional schools 1 Other 16.
4. Senior majors, average past five years: 20.
5. Students involved in research, average past five years: Acad. yr. 5 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 19,000 % used for teaching 99 Research 1
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR-Varian A-60
UV-Vis-near IR-Cary 14
IR-P-E 257
Polarograph-L&N type E
GC-Loenco 160 (TC & FID)
X-ray diffractometer-Picker Nuclear
Liq. Scintillation counter-Nuclear Chicago-Unilux III
AA-Jarrell-Ash
LC-Altex 110
Pyrolysis GC-modified Carle 9000

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Some Total journal subscriptions? 46 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 10.
4. Computer facilities: Department-DEC PDP-8 with graphics and plotter and connected to campus computer; Campus-DEC System-10; Tektronix graphics terminal in department.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Faculty may apply for Research Seed Grants. Amounts awarded average $1800 to two faculty members.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None
3. Faculty teaching loads: Contact hours 20 Load credit for research? No
4. Sabbatical or leave support for research: Faculty may apply for sabbatical leave at 50% salary for full year or full salary for one-half year. Eligible every seventh year.

FACULTY PROFILE

HEDRICK, JACK L. (b.1938), Professor. B.S., 1959, Elizabethtown College, M.S., 1962, University of Pittsburgh. Analytical Chemistry. Pyrolysis gas chromatography.

Jack L. Hedrick, The Keller Plan and Student Evaluation, J. Chem. Ed., 52, 65(1975).

Jack L. Hedrick, A Manual for Instrumental Analysis, 4th ed., Elizabethtown College, Elizabethtown, PA, 1975.

Jack L. Hedrick, A Manual for General Chemistry Laboratory, 2nd ed., Elizabethtown College, Elizabethtown, PA, 1974.

Grant active 1977-78; Research Seed Grant, $1650, The Qualitative Identification of Bacteria by Pyrolysis Gas Chromatography.

PROCTOR, ZOE G. (b.1934), Professor. B.S., 1956, Elizabethtown College; M.S., 1960, Bucknell University. Additional graduate study, University of Delaware. Organic Chemistry. Nitrogen heterocycles and natural products.

RANCK, JOHN P. (b.1936), Professor and Assistant Dean. B.S., 1958, Elizabethtown College; M.A., 1960, Ph.D., 1962, Princeton University; postdoctoral at University of California, Berkeley and H.C. Ørsted Institute, University of Copenhagen. Theoretical Chemistry. *Ab initio* molecular orbital calculations; computers in chemistry.

J.P. Ranck, A Course in Computer Interfacing and Instrument Automation Based Upon Student Projects, Proceedings of the Seventh Conference on Computers in the Undergraduate Curriculum, 7, 127(1976).

R.R. Reeder and J.P. Ranck, ELIZA - A Chemical Information System for Undergraduates, Proceedings of the Seventh Conference on Computers in the Undergraduate Curriculum, 7, 53(1976).

Four computer programs distributed through program exchanges and one program distributed commercially.

SCHAEFFER, CHARLES D., JR. (b.1948), Assistant Professor. B.S., 1970, Franklin and Marshall College, Ph.D., 1974, State University of New York at Albany; postdoctoral, 1974-76, Yale University. Organometallic Chemistry. Synthesis, reactivity and structure of novel divalent main group compounds, carbon-13 chemical shifts and coupling constants as structure assignment aids in complex molecules, multinuclear nmr spectroscopy. 14 publications, 1973-1978.

C.D. Schaeffer, Jr., J.J. Zuckerman, and S.E. Ulrich, [illegible] the Relationship Between the Tin-119*m* Mössbauer Isomer Shift and Nuclear Magnetic Resonance Parameters of Organotin Compounds: Extension of the May and Spijkerman Model to Carbon-13 NMR Measurements on Phenyltrimethyltins and to Higher Alkyltin Hydrides, Inorg. Nucl. Chem. Lett., 14, 55(1978).

J.W. Faller, B.V. Johnson, and C.D. Schaeffer, Jr., Organometallic Conformational Equilibria. XX. Preferred Orientations and Rotational Barriers of π-Olefins in Chiral Tin-Iron Compounds. The Isolation of Diastereoisomers in Prochiral Olefin Derivatives, J. Am. Chem. Soc., 98, 1395(1976).

M.E. Bishop, C.D. Schaeffer,Jr., and J.J. Zuckerman, Far Infrared and Raman Assignments of Substituted Aryltrimethyltins, Spectrochim. Acta, Part A, 32, 1519(1976).

C.D. Schaeffer, cont'd.

W.D. Honnick, M.C.Hughes, C.D. Schaeffer,Jr., and J.J. Zuckerman, Tin-119*m* Mössbauer, Infrared, Nuclear Magnetic Resonance, Equilibrium and Thermodynamic Measurements on Complexes of Dimethyltin Dichloride with Substituted 1,10-Phenanthrolines and 2,2'-Bipyridines, Inorg. Chem., 15, 1391(1976).

M.E. Bishop, C.D. Schaeffer,Jr., and J.J. Zuckerman, Carbon-13 NMR Studies of Exchange in $R_3SnER'_n$ Derivatives, J. Organomet. Chem., 101, C19(1975).

Grants active 1977-78: Research Corporation Cottrell College Science Grant, $7,000, Studies of Low Oxidation State Main Group Organometallic Compounds; American Chemical Society Petroleum Research Fund,Type B, $13,000, Studies of Low Oxidation State Main Group Organometallic Compounds.

SPANGLER, MARTIN O.L. (b.1928), Professor and Chairman. B.A., 1950, Bridgewater College; M.S., 1953, Ph.D., 1959, Virginia Polytechnic Institute and State University. Organic Chemistry and Biochemistry. Synthesis of potential antitumor agents containing sugar moieties. Grants active 1977-78: Ruth W. Spangler Memorial Fund, $2450, Synthesis of Potential Antitumor Agents; AMP, Inc., $8460, Synthesis of Some Thiols and benzotriazoles.

STAMBAUGH, O.F. (b.1908), Professor Emeritus. B.S., 1930, Lebanon Valley College; M.S., 1933, Ph.D., 1943, Pennsylvania State University. Analytical Chemistry. Analytical uses of chelates and sequestering agents.

Erskine College

Due West, S.C. 29639

Fall 1978 ug enrollment 650

Degrees offered B.A. & B.S.

Telephone (803)-379-8825

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3. 2. Support staff: FTE's secretary 1/2 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 2 Grad. school 1 Industry ______ Professional schools 1 Other ______.
4. Senior majors, average past five years: 4.
5. Students involved in research, average past five years: Acad. yr. 1 Summer 0
6. National student honors, past five years (NSF fellowships, etc.)
NONE

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 10,500 % used for teaching 92% Research 8%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
NMR 60 MHz (P-E R 24B)
G C (P-E 3920B)
I R (P-E 237B)
U V-VIS (P-E 570)
A A (P-E 272)
3. Library resources: Chem. abstracts? No Volume indices? No Collected indices? No Total journal subscriptions? 12 Computer literature search service? Pending Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 10.
4. Computer facilities:
PDP 11 2 Departmental Terminals

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
$6000 for Research Equipment
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
NSF-ISEP $15,600; Title VI $18,923; SST $13,470
3. Faculty teaching loads: Contact hours 18 Load credit for research? None
4. Sabbatical or leave support for research: None

FACULTY PROFILE

FIKES, LEWIS E. (b. 1943) Assistant Professor. B.A., 1965, Earlham College; M.A.T., 1966, The Johns Hopkins University; M.S., 1970, The Ohio State University; Ph.D., 1972, The Ohio State University. Organic Chemistry. Rearrangements to electron-deficient centers; synthesis of fluoro-substituted polycyclic aromatic hydrocarbons.

L.E. Fikes and H. Shechter, Effects of Acid Strength on Schmidt Reactions of Alkyl Cyclopropyl Ketones, Tetrahedron Lett., 29, 2525 (1976).

L.E. Fikes and H. Shechter, Effects of Acid Strength on Schmidt Reactions of Alkyl Cyclopropyl Ketones and Alkyl Phenyl Ketones, J. Org. Chem., 43, 000 (1978).

M.S. Newman, L.E. Fikes, et.al., Reactions of Dihydrodimethyl Polycyclic Aromatic Hydrocarbons Under Acidic Conditions, J. Med. Chem., 000 (1978).

KNIGHT, J. A. (b. 1943) Associate Professor and Vice-President for Academic Affairs. A.B., 1965, Erskine College; Ph.D., 1969, University of North Carolina; Postdoctorate, 1969-70, Duke University. Inorganic Chemistry. Boron-sulfur compounds and boron analogs of organic compounds.

No publications 1973-78.

LOWRY, BRIGHT A. (b. 1936) Associate Professor and Chairman. B.S., 1958, Massachusetts Institute of Technology; Ph.D., 1963, University of Chicago; Postdoctorate, 1963-64, Dartmouth College; Postdoctorate, 1964-66, University of North Carolina. Physical Chemistry. Physical properties of liquid crystals.

Two publications, 1973-78.

J.W. Summerford, J.R. Boyd, and B.A. Lowry, Angular and Temperature Dependence of Viscosity Coefficients in a Plane Normal to the Direction of Flow in MBBA, J. Applied Phys, 46, 970 (1975).

S.E. Monroe,Jr., G.C. Wetsel, M.R. Woodard, and B.A. Lowry, Ultrasonic Investigation of Viscosity Coeffients in the Liquid Crystal, EBBA, J. Chem. Phys, 63, 5139 (1975).

Research Corporation Grant ($13,800) (two years).

THOMAS, HOWARD E. (b. 1941) Assistant Professor, B.Sc., 1962, University of Bristol, U.K.; Ph.D. 1969, University of Bristol. Physical Chemistry. Surface chemistry; the gas-solid interface.

R.N. Ramsay, R.A. Pierotti and H.E. Thomas, The Physical Adsorption of Argon on Boron Nitride - A Two-Surface Analysis of High Temperature Adsorption Data, J. Chem. Phys, 59, 6163 (1973)

R.A. Pierotti and H.E. Thomas, Virial Analysis of Low Coverage Physical Adsorption Data on Heterogenious Surfaces, J.C.S. Faraday I, 70, 1725 (1974)

FRANKLIN AND MARSHALL COLLEGE

Lancaster, PA 17604

Fall 1978 ug enrollment 1950

Degrees offered B A

Telephone (717) 291-4123

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9. 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 44 Grad. school 12 Industry 2 Professional schools 18 Other 12.
4. Senior majors, average past five years: 25.
5. Students involved in research, average past five years: Acad. yr. 13 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

   none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 31,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR - 90MHz(P-E R-32)
   MS (Varian EM600)
   UV-Vis (P-E 402 and GCA/McPherson EU-700)
   High Pressure Lab Reactor (Parr-4560)
   AA (P-E 103)
   GC (P-E F11)
   LC (duPont 841)
   DSC (P-E DSC-1)
   IR (P-E 621)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 32 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 18.
4. Computer facilities: Department; minicomputer, Data General Nova 3 and Intercolor 8051 microcomputer/graphics videoterminal. Campus; Univac Spectra 70/46 computer.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $5,000/yr. chemicals and glassware; $5-7,000/yr. for equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   Du Pont College Science Grant, $6,500.
3. Faculty teaching loads: Contact hours 13 Load credit for research? occasional
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 5th year.

FARRELL, JOHN J. (b.1937) Associate Professor. B.S., 1960, Baldwin-Wallace College, Ph.D., 1964, University of Pittsburgh. *Physical Chemistry*. Temperature dependence of paramagnetic and antiferromagnetic materials.

F.A. Snavely, *J.E. Scott, *D. Richmand, and J. J. Farrell, Magnetic Behavior of Copper(II) and Nickel(II) Derivatives of Substituted Benzeneazo-5-pyrazolones and -2,4-pentanedione, *J. Coord. Chem.*, *6*, 167(1977).

J. J. Farrell, Physical and Chemical Properties of the Copper-Alanine System, *J. Chem. Educ.*, *54*, 445(1977).

HERSHEY, STEPHEN A. (b. 1949) Assistant Professor. B.S., 1971, Juniata College, Ph.D., 1976, The Ohio State University. *Analytical Chemistry*. Equilibrium and kinetic studies of the interaction of metal ions with biolgoically important ligands; applications of laboratory computers to data acquisition and experiment control.

S.A. Hershey and D.L. Leussing, Rate of Carbinolamine Formation between Pyridoxal-5'-Phosphate and Alanine, *J. Am. Chem. Soc.*, *99*, 1992(1977).

RICH, AUSTIN J. (b. 1930) Associate Professor. B.S., 1952, Bates College, M.S., 1955, Ph.D., 1960, Purdue University. *Organic Chemistry*. Synthesis and stereochemistry.

SANDEL, BONNIE B., (b. 1948) Assistant Professor. B.S., 1970, Bucknell University, Ph.D., 1974, University of California, Berkeley. *Organic Chemistry*. Heteroaromatic reactivity, solvent and micellar effects on reactivity.

D.S. Noyce and B.B. Sandel, Solvolytic Reactivity of Pyrazolylethanol and Isoxazolylethanol Derivatives, *J. Org. Chem.*, *41*, 3640(1976).

B. Bartman, E.C. Gordon, M. Gonzalez-Jutas, D.S. Noyce and B.B. Sandel, Transmission of Substituent Effects. Correlation of Methyl to Hydrogen Rate Ratios in Diverse Heterocyclic Systems with CNDO/2 Parameters, *J. Org. Chem.*, *41*, 776(1976).

D.S. Noyce and B.B. Sandel, Solvolysis of Isothiazole Analogs of Cumyl Chloride. Determination of the Brown Electrophilic Substituent Constants for Isothiazole Derivatives, *J. Org. Chem.*, *40*, 3381(1975).

SCHREIBER, JERRY L. (b. 1946) Assistant Professor. B.S., 1968, University of Maryland, M.S., 1969, University of Wisconsin, Ph.D., 1973, University of Toronto. *Physical Chemistry*. Chemical dynamics of simple reactions.

Ten publications, 1973-1978.

J.C. Polanyi and J.L. Schreiber, Test of the Information Theory of Branching Ratios by Classical Trajectory Computations, *Chem. Phys.*, *31*, 113(1978).

J.C. Polanyi, J.L. Schreiber, and J.J. Sloan, Distribution of Reaction Products XI. $H + F_2$, *Chem. Phys.*, *9*, 403(1975).

J.C. Polanyi, and J.L. Schreiber, Distribution of Reaction Products (Theory) X. Investigation of an *Ab Initio* Energy Surface for $F + H_2 \rightarrow HF + H$, *Chem. Phys. Lett.*, *29*, 319(1974).

J.C. Polanyi and J.L. Schreiber, The Dynamics of Bimolecular Reactions, Chapter 9 of Physical Chemistry-An Advanced Treatise, Volume VI, edited by H. Eyring, D. Henderson, and W. Jost, Academic Press, New York, 1974.

J.L. Schreiber, Comment of Microscopic Reversibility in Classical Trajectory Calculations, *Faraday Disc. Chem. Soc.*, *55*, 72(1973).

Grant Active, 1978-80; Research Corporation, $6,000.

SNAVELY, FRED A. (b. 1919) Professor. B.S., 1949, Franklin and Marshall College, Ph.D., 1952, Pennsylvania State University. *Inorganic Chemistry*. Coordination compounds; structure of arylazo compounds and formation constants of their metal derivatives, preparation of metal derivatives and relative bonding to O, N, and S.

Three publications, 1973-1978.

C.H. Yoder, *S. Kennedy, and F.A. Snavely, Geometric Isomerism in the Phenylhydrazones of Some α-Dicarbonyl Compounds, *J. Org. Chem.*, *43*, 1077(1978).

SNAVELY, FRED A., cont'd

F.A. Snavely, *J.E. Scott, *D. Richmand, and J. J. Farrell, Magnetic Behavior of Copper(II) and Nickel(II) Derivatives of Substituted Benzeneazo-5-pyrazolones and -2-4-pentanediones, J. Coord. Chem., 6, 167(1977).

SUYDAM, FRED H. (b. 1923) Professor. B.S., 1946, Franklin and Marshall College, Ph.D., 1950, Northwestern University. Organic Chemistry. Synthesis, structure determination.

F.H. Suydam, Study Guide to Chemistry, Harcourt Brace Jovanovich, Inc., New York, 1976.

C.H. Yoder, F.H. Suydam and F.A. Snavely, Chemistry, Harcourt Brace Jovanovich, Inc., New York, 1975.

VAN HORN, RUTH W. (b. 1918) Professor. B.A., 1939, M.A., 1940, University of California, Los Angeles, Ph.D., 1944, Pennsylvania State University. Organic Synthesis.

YODER, CLAUDE H. (b. 1940) Associate Professor and Chairman. B.S., 1962, Franklin and Marshall College, Ph.D., 1966, Cornell University. Organometallic Chemistry. Structure of organometallic amides and amines, effects of structure on barriers to rotation in amides, substituent effects on carbon-13 proton coupling constants.

Fifteen publications, 1973-1978.

*R.W. Hillyard, *C.M. Ryan and C.H. Yoder, The Structure of Some Amides Obtained from Chloromethyldimethylchlorosilane, J. Organometal. Chem., 153, 369(1978).

*M.D. Wunderlich, *L.K. Leung, *J.A. Sandberg, *K.D. Meyer, and C.H. Yoder, The Effect of Carbonyl Substituents on the Barriers to Rotation in N,N Dimethylamides, J. Am. Chem. Soc., 100, 1500(1978).

C.H. Yoder, Teaching Ion-Ion, Ion-Dipole, and Dipole-Dipole Interactions, J. Chem. Educ., 54, 402(1977).

C.H. Yoder, *J.A. Sandberg, and *W.S. Moore, Electronic and Steric Effects of Substitution at Nitrogen on Hindered Rotation in Formanilides, J. Am. Chem. Soc., 96, 2260(1974).

C.H. Yoder, *W.C. Copenhafer, and *B. DuBeshter, The Structure of Trimethylsilyl Amides, J. Am. Chem. Soc., 96, 4283(1974).

Grant active 1977-1978: Research Corporation Cottrell College Science Grant, $7,950, Structure and Dynamics of Organometallic Amides.

FURMAN UNIVERSITY
Greenville, S.C. 29613

Fall 1978 ug enrollment 2200
Degrees offered B.S., M.S.
Telephone (803) 294-2056

DEPARTMENT PROFILE

Student, Faculty & Staff Base

Division
1. Faculty: FTE 7 . 2.Support staff: FTE's secretary 1 Stockrm 0 Technician 1
3. 1978 seniors & their placement: Total 12 Grad. school 4 Industry 1
Professional schools 6 Other 1 .
4. Senior majors, average past five years: 16 .
5. Students involved in research, average past five years: Acad. yr. 5 Summer 15
6. National student honors, past five years (NSF fellowships, etc.)
Two - NSF Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 ~20,000 % used for teaching 50 Research 50
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

Bruker pulsed nmr	Bendix TOF mass spectrometer
P.E. R-20 nmr	Jarrell-Ash 500 Laser Raman spectrometer
P. E. 580 IR	N_2 and Dye Laser
Interdata 6/16 Computer	Varian 118C uv-vis spectrometer
Varian 4500 esr	Varian LEED Auger surface analysis system

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes
Total journal subscriptions? 70 Computer literature search service? No
Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 50 .

4. Computer facilities:

University: H.P. 3000, Department: Interdata 6/16

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Not designated 2,000 - 3,000 per year.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

Dreyfus -- 12,000 Summer 1978
NSF-URP -- 23,000 Division ~ 1/2 to chemistry

3. Faculty teaching loads: Contact hours ~8 Load credit for research? not formally

4. Sabbatical or leave support for research:

Full year at 1/2 salary or
Half year at full salary.

ARRINGTON, CHARLES A., JR. (b. 1939) Associate Professor and Chairman. B.S., 1960, Furman University, M.A., 1962, Ph.D. 1965, Harvard University. *Physical Chemistry*. Gas-phase kinetics and electron spin resonance.

C. A. Arrington and E. A. Ogryzlo, Infrared Emission From Gaseous HNC," *J. Chem. Phys.*, *63*, 3670 (1975).

C. A. Arrington, Jr. and *D. J. Cox, "Arrhenius Parameters for the Reaction of Oxygen Atoms O(^{3}P), with Propyne," *J. Phys. Chem.*, *79*, 2584 (1975).

HARRIS, WILLIAM C. (b. 1944) Associate Professor. B.S., 1966, College of William and Mary, Ph.D., 1970, University of South Carolina. *Physical Chemistry*. Infrared and Raman spectroscopy. On leave, 1978-1979.

Twenty-three publications, 1973-1978.

W. C. Harris, R. W. MacNamee and *J. R. van Venrooy, "Interpretation of the Vibrational Spectra of Small Ring Systems: Matrix Isolation and Condensed Phase Studies of Perfluorocyclobutanone, *Appl. Spectrosc.* *31*, 164 (1977).

W. C. Harris, D. A. Coe, *M. K. Parpart and R. S. Pyron, "Vibrational Spectra and Structure of 4-Chloro-1,2-Butadiene," *J. Phys. Chem.*, *81*, 952 (1977).

S. F. Bush, P. W. Dixon, Jr. and W. C. Harris, "Raman Spectra and Internal Rotation of 1,1-Dimethylcyclopropane and 1,1-Dimethyl-d_6 Cyclopropane," *J. Chem. Phys.*, *66*, 5699 (1977).

W. C. Harris, "An Alternative to Fourier Transform Infrared," *Research/Development*, *28*, 26 (1977).

W. C. Harris, *J. R. Holtzclaw and V. F. Kalasinsky, "Vibrational Spectra and Structure of 1,2-Difluoroethane: *Gauche-Trans* Conformers," *J. Chem. Phys.* *67*, 3330 (1977).

JONES, TAPPEY H., (b. 1948) Assistant Professor. B.S., 1970, Virginia Military Institute, Ph.D., 1974, University of North Carolina. *Organic Chemistry*. Chemical ecology and photochemistry.

Fourteen publications, 1973-1978.

T. H. Jones, J. Meinwald, K. Hicks, and T. Eisner, "Characterization and Synthesis of Volatile Compounds from the Defensive Secretions of some "Daddy Longlegs" (Arachnida: Opiliones: *Leiobunum* spp.)," *Proc. Natl. Acad. Sci. USA*, *74*, 419 (1977).

J. Meinwald, T. H. Jones, T. Eisner, and K. Hicks, "New Methylcyclopentanoid Terpenes from the Larval Defensive Secretion of a Chrysomelid Beetle (*Plagiodera versicolora*)," *Proc. Natl. Acad. Sci. USA*, *74*, 2189 (1977).

T. Eisner, W. E. Conner, K. Hicks, K. R. Dodge, H. I. Rosenberg, T. H. Jones, M. Cohen, and J. Meinwald, "Stink of the Stinkpot Turtle Identified: ω-Phenylalkanoic Acids," *Science*, *196*, 1347 (1977).

T. Eisner, T. H. Jones, D. J. Aneshansley, W. R. Tschinkel, R. E. Silberglied, and J. Meinwald, "Chemistry of Defensive Secretions of Bombardier Beetles Brachinini, Metriini, Ozaenini, Paussini)," *J. Insect Physiol.*, *23*, 1383 (1977).

J. Meinwald and T. H. Jones, "Synthesis and Stereochemistry of Chrysomelidial and Plagiolactone," *J. Am. Chem. Soc.*, *100*, 1883 (1978).

Grants active for 1978-1979: Research Corporation CCSP Grant, $8,400.

KANE-MAGUIRE, NOEL A. P. (b. 1942) Associate Professor. B. S., 1962, B. S. with honors, 1963, Ph.D., 1969, University of Queensland, Australia. Inorganic Chemistry. Photochemical and thermal reactions of transition metal complexes.

Fifteen publications, 1973-1978.

N. A. P. Kane-Maguire, *R. M. Tollison, and *D. E. Richardson, "Stereoselectivity in Electron Transfer Reactions," Inorg. Chem. 15, 499 (1976).

N. A. P. Kane-Maguire and *S. A. Edwards, "Thermal Racemization of Tris (1,10-phenanthroline) Chromium (III)," J. Inorg. Nucl. Chem., 38, 1037 (1976).

N. A. P. Kane-Maguire, *J. E. Pfifer, and C. G. Toney, "Relaxation Pathways of Chromium (III) Quartet Excited States," Inorg. Chem., 15, 593 (1976).

N. A. P. Kane-Maguire, *D. E. Richardson, and C. G. Toney, "Intersystem Crossing in Chromium (III) Photochemistry," J. Amer. Chem. Soc., 98, 3996 (1976).

N. A. P. Kane-Maguire, C. G. Toney and *B. Swiger, A. W. Adamson and R. E. Wright, "Reversible Intermolecular Energy Transfer between Chromium (III) Complexes in Fluid Solution," Inorg. Chim. Acta, 22, L11 (1977).

Grants active for 1977-1979: PRF Type AC Grant, $23,100.

KNIGHT, LON B., JR. (b. 1944) Associate Professor. B.S., 1966, Mercer University, Ph.D., 1970, University of Florida. Physical Chemistry. High temperature reaction techniques and ESR spectroscopy.

Ten publications, 1973-1978.

L.B. Knight, "ESR Matrix Isolation Observation of AlH^+ Formed During the High Temperature Vaporization of Al_2O_3," Proceedings of the Tenth Materials Research Symposium, National Bureau of Standards, 1978.

L. B. Knight, *M. Duncan, *W. T. Beaudry, Alfreda Mouchet, "High Temperature Generation and ESR Matrix Isolation Studies of ZnF and CdF in Neon and Argon Matrices," J. Magnetic Resonance, 32, 0000 (1978).

L. B. Knight, *K. S. Stewart and *W. T. Beaudry, "Unusual Behavior of Vaporized Magnesium and Evidence for Gas-Surface Exchange," J. Physical Chemistry, 82, 1295 (1978).

L. B. Knight and *M. A. Ebener, "Matrix Isolation of Mg_2 and Mg_n Molecules in Neon, Argon and Nitrogen Hosts," J. Mol. Spectr. 61, 412 (1976).

L. B. Knight, R. D. Brittain, *M. A. Starr, *C. H. Joyner, "Ultraviolet Emission from Magnesium Atoms Isolated in Rare Gas Matrices," J. Chem. Phys., 61, 5289 (1974).

Grants active 1977-1979: NSF $50,400; Research Corporation, One year of Remaining Support $6,000.

KUBLER, DONALD G., (b. 1923) Professor. B.S., 1947, University of South Carolina, Ph.D., 1952, University of Maryland. Organic Chemistry. Chemistry of acetals and of α,β-unsaturated ethers, solution kinetics.

*B. Cox, D.G. Kubler and *C.A. Wilson, "Experiments with Electrophilic Aromatic Substitution Reactions," J. Chem. Ed., 54, 379 (1977).

T.S. Davis, G.A. Gettys and D.G. Kubler, "Kinetic Salt Effects and Substituent Effects on Rates of Dimethyl Acetal Formation for Benzaldehydes," J. Org. Chem., 41, 2349 (1976).

D. B. Dennison, G. A. Gettys, D. G. Kubler and *D. Shepard, "Kinetic Salt Effects on the Hydrolysis of Benzaldehyde Dimethyl Acetal," *J. Org. Chem.*, *41*, 2344 (1976).

*M. Allen, *C. Joyner, D. G. Kubler, *P. Wilcox, "The Dimerization of Isobutylene: A Student Experiment," *J. Chem. Ed.*, *53*, 175 (1976).

T. S. Davis, P. D. Feil, D. G. Kubler, and D. J. Wells, Jr., "Substituent Effects on Rates and Equilibria for Benzaldehyde--Benzaldehyde Dimethyl Acetal Interconversion," *J. Org. Chem.*, *40*, 1478 (1975).

PATTERSON, CHARLES STUART (b. 1930) Professor. B. S., 1950, Furman University, M.S. Ph.D., 1955, University of North Carolina. *Physical Inorganic Chemistry*. The nature of solutions. On leave, 1978-1979.

TRZUPEK, LARRY S. (b. 1948) Assistant Professor. B.S., 1970, Loyola University, Ph.D., 1974, Massachusetts Institute of Technology. *Organic Chemistry*, *Biochemistry*. Peptide chemistry; organometallics, carbanions.

L. S. Trzupek, T. L. Newirth, E. G. Kelly, N. E. Sbarbati and G. M. Whitesides, "Mechanism of Reaction of Carbon Monoxide with Phenyllithium," *J. Amer. Chem. Soc.*, *95*, 8118 (1973).

WILSON, CHARLES A., II, (b. 1946) Assistant Professor. B.S., 1968, M.S., 1972, Furman University; Ph.D., 1975, University of South Carolina. *Organic Chemistry*. Synthesis, natural products.

W. C. Agosta, B. Byrne and C. A. Wilson, "Convenient preparation of 2-norbornen-2-carbonitriles from 2-norbornenes," *Tetrahedron Letters*, 2189 (1976).

T. A. Bryson and C. A. Wilson, "1-Aza Spiro Annelation. A Synthetic Approach to Naturally Occurring Heterocyclic Spiranes," Synthetic Communications, *6*, 521 (1976).

T. A. Bryson, R. B. Gammill and C. A. Wilson "Synthesis of α-Methylene γ-Butyrolactones," Synthetic Communications, *5*, 245 (1978).

Also two patents granted in 1977 and consigned to the General Electric Company.

Grants active for 1978-1979: Research Corporation CCSP Grant, $8,400.

GETTYSBURG COLLEGE
Gettysburg, PA 17325

Fall 1978 ug enrollment 1974

Degrees offered A.B.

Telephone (717) 334-3131

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2. Support staff: FTE's secretary 1 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 6 Grad. school 3 Industry 0
Professional schools 1 Other 2 .
4. Senior majors, average past five years: 8 .
5. Students involved in research, average past five years: Acad. yr. 5 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)
None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,064 % used for teaching 85 Research 15
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR, 60MHz (Varian T-60)
MS (Varian EM-600 and Bendix TOF 12-100)
IR (P-E 21 and 735)
UV-Vis (B & L 505)
GC (Aerograph A-90-P)
Polarimeter (Rudolph 62)
Dipolmeter (WTW DM01)
Gouy balance

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes
Total journal subscriptions? 28 Computer literature search service? No
Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 14 .

4. Computer facilities: Campus -- Burroughs 6700; department -- none

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
No specific college budget: approximately $1000 spent on research from Supplies-Materials budget.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
DuPont College Science Grant, $6,500

3. Faculty teaching loads: Contact hours 13 Load credit for research? No

4. Sabbatical or leave support for research: Faculty may be awarded sabbatical leaves for one-half year (including January term) at full pay or for entire academic year at 1/2 salary. Eligible every seventh year.

FORTNUM, DONALD H. (b. 1932) Professor. B.S., Carroll College (WI), Ph.D., 1958, Brown University. Physical Chemistry. Transition metal complexes; thermal analysis.

Grant active 1977-1978: The Andrew W. Mellon Foundation, $730, Digital Techniques and Computing.

HATHAWAY, SUSAN J. (b. 1950) Assistant Professor. B.A., 1971 and M.A., 1973, SUNY at Potsdam, Ph.D., 1975, University of New Hampshire. Organic Chemistry. Asymmetric homogeneous hydrogenation.

J. D. Morrison, W. F. Masler, and S. Hathaway, chapter on Asymmetric Homogeneous Hydrogenation with Chiral Rhodium-Phosphine Catalysts in CATALYSIS IN ORGANIC SYNTHESES 1976, P. N. Rylander and H. Greenfield, editors, Academic Press, N.Y., 1976, pp. 203-233.

JACKSON, LILLIAN S. (b. 1924) Assistant Instructor. B.A., 1946, Wheaton College (MA), M.A., 1947, Bryn Mawr College. General Chemistry.

PARKER, WILLIAM E. (b. 1940) Associate Professor. B.A., 1962, Haverford College, M.S., 1965 and Ph.D., 1967, The University of North Carolina at Chapel Hill. Inorganic Chemistry. Coordination chemistry; kinetics of reaction of polynuclear cobalt complexes.

W. E. Hatfield and W. E. Parker, SYMMETRY IN CHEMICAL BONDING AND STRUCTURE, Charles E. Merrill Publishing Co., Columbus, OH, 1974.

ROWLAND, ALEX T. (b. 1931) Professor and Chairman. A.B., 1953, Gettysburg College, Ph.D., 1958, Brown University. Organic Chemistry. Stereochemistry of steroid oxides and conformations of highly substituted cyclohexanones.

A. T. Rowland, *R.S. Drawbaugh, and *J. R. Dalton, Steroid Oxetanones. 3. Synthesis of $5,7\alpha$-Epoxy-5α-cholestan-6-ones, J. Org. Chem., 42, 487 (1977).

A. T. Rowland, The Boiling Tube, J. Chem. Educ., 53, 802 (1976).

A. T. Rowland, A Reliable Synthesis of 3β-Acetoxy-6-nitrocholest-5-ene, Steroids, 26, 251 (1975).

*D. M. Bleile, *C. E. Malmberg, and A. T. Rowland, Steroid Cyclicsulfites. III. Conformational and Configurational Aspects of Steroid 3,5-Cyclicsulfites, Steroids, 26, 29 (1975).

A. T. Rowland, Stereoisomerism section in ENCYCLOPEDIA OF CHEMISTRY, Hampel and Hawley, editors, Van Nostrand Reinhold Company, 1973.

RUDEWICZ, PATRICK J. (b. 1955) Assistant Instructor. A.B., Gettysburg College, 1977. Organic and Analytical Chemistry.

SCHILDKNECHT, CALVIN E. (b. 1910) Professor. B.S., 1931, Gettysburg College, Ph.D., 1936, The Johns Hopkins University. Organic Polymer Chemistry. Addition polymerizations, stereoregulation, maleic anhydride.

Eight articles and books, 1973-1978.

C. E. Schildknecht, *K. F. Falkenstein, *J. C. S. Wood, and *R. W. Ruths, Maleic Anhydride Polymerizations, Org. Coatings and Plastics Chem., 39, 555 (1978).

C. E. Schildknecht, Allyl Monomers and Polymers, in ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY, Vol. 2, 3rd edition, John Wiley & Sons, Inc., New York, 1978.

C. E. Schildknecht and *J. Tannebring, Polyvinyl Alcohols, Polymer Preprints, 15, 439 (1974).

C. E. Schildknecht, *J. Tannebring, and *R. F. Williams, Polyolefins and Polyvinyl Ethers, Polymer Preprints, 15, 421 (1974).

C. E. Schildknecht, ALLYL COMPOUNDS AND THEIR POLYMERS, John Wiley & Sons, Inc., New York, 1973.

GOSHEN COLLEGE

Goshen, IN 46526

Fall 1978 ug enrollment 1093

Degrees offered B.A.

Telephone (219) 533-3161

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 2¼ . 2. Support staff: FTE's secretary 1/5 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 2 Grad. school 2 Industry ____ Professional schools ____ Other ____.
4. Senior majors, average past five years: 4 .
5. Students involved in research, average past five years: Acad. yr. ____ Summer ____
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 24,000 % used for teaching 95 Research 5
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (Varian EM 360)
AA (I.L.251)
AA Flameless Atomizer (I.L.555)
GC (Varian Aerograph 1520)
IR (Beckman IR10)
UV-Vis (Beckman DB & Beckman DU)
Polarograph (Home-made)
Radio-isotope detectors/scalars (Varian)
D.T.A. (Fisher 260P)
Hydrogenator
Spinning Band Column

3. Library resources: Chem. abstracts? No Volume indices? No Collected indices? No Total journal subscriptions? 26 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) ____.

4. Computer facilities: Department; minicomputer, Hewlett-Packard 2100A. Campus; PDP 11/70 with Tektronix 4006-1 graphics CRT Terminal in Department.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $5,000 institution wide by application.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None

3. Faculty teaching loads: Contact hours 13 Load credit for research? No

4. Sabbatical or leave support for research: Sabbatical leave very regular, after 10 years and every eighth year thereafter. Choice of full salary for one trimester or two-thirds salary for nine months, diminished by amount of outside grant, with special consideration given for cost of living or other increased or unusual expenses.

FACULTY PROFILE

SMUCKER, ARTHUR A. (b. 1923) Professor and Department Chairman. B.A., 1949, Goshen College, M.S., 1951, Ph.D., 1954, University of Illinois. Biochemistry. Enzyme purification and study. Natural products.
Four publications, 1959-1974.

R.J. Carlotti, G.F. Garnett, W.T. Hsieh, A.A. Smucker, C.S. Vestling and H.P. Morris, Comparison of Purified Lactate Dehydrogenases from Normal Rat Liver and Morris Hepatomas in Rats and in Culture, Biochim. et Biophys. Acta, 341, 357 (1974).

CLEMENS, DONALD G. (b. 1939) Professor. B.A., 1961, Goshen College, Ph.D., 1966, University of Pennsylvania. Organic Chemistry. Reaction of Allylic Alcohols with Concentrated Hydrochloric Acid and Thionyl Chloride, An Abstract Dissertation, University of Michigan, 1966.

WEAVER, HENRY D. (b. 1928) Professor. B.S., 1950, George Washington University, M.S., 1953, University of Delaware, Ph.D., 1953, University of Delaware. Physical Chemistry. Kinetics of ligand exchange reaction.
Five publications, 1958-1962.

YORDY, JOHN D. (b. 1942) Assistant Professor. B.A., 1967, Goshen College, Ph.D., 1974 Michigan State University. Organic Chemistry. Identification and synthesis of natural products; preparation and reactions of fused-ring cycloproponal derivatives; preparation of organosulfur compounds.
Six publications, 1973-1978.

J.D. Yordy and M.A. Newman, Crystal Structure of 5 -bromo-8 ,9 -dimeltish-hydrindone-1,4-dione, J. Cryst. Mol. Struct., 4, 121-217 (1974).

J.D. Yordy and W. Reusch. A Remarkable Methyl Substituent Effect in a Twistane Aldol Synthesis, J. Org. Chem., 40, 2086 (1975).

W. Reusch, K. Grimm, J.E. Karoglan, J. Martin, J.P. Subrahomanian, P.S. Venkataramani, and J.D. Yordy, Transformation of Cycloproponal Intermediates. 3. Ring-opening Reactions of 6-methyl-5-hydroxytricyclo 4.4.0.0^{1,5} decon-9-one, J. Am. Chem. Soc., 99, 1958 (1977).

W. Reusch, K. Grimm, J.E. Karoglan, J. Martin, J.P. Subrahamonian, Yock-Chai Toong, P.S. Venkataramoni, J.D. Yordy, and P. Zoutendam, Preparation of Fused-Ring Cycloproponal Derivatives by Reductive Cyclization of Bicyclin Enediones Related to the Wieland-Miescher Ketone, J. Am. Chem. Soc., 99, 1953 (1977)

J.D. Yordy and W. Reusch, Transformations of Cyclopropanol Derivatives. 4. Alkyl Substituent Effects in Ring-Opening Reactions of 6-Methyl-5-hydroxytricyclo 4.4.0.0 ^{,5} decon-9-one, J. Am. Chem. Soc., 99, 1965 (1977)

GRINNELL COLLEGE
Grinnell, IA 50112

Fall 1978 ug enrollment 1230
Degrees offered BA
Telephone 515/236-6181

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 2/3 Stockrm 3/4 Technician 3/4
3. 1978 seniors & their placement: Total 13 Grad. school 4 Industry 1 Professional schools 5 Other 2 .
4. Senior majors, average past five years: 14 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 8
6. National student honors, past five years (NSF fellowships, etc.)

Rhodes Scholarship, 1978 (Susan Duffey)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 85 Research 15
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

nmr- Perkin Elmer R12B
ir - Perkin Elmer Infracord
ir- Beckman IR20A
uv-vis- Beckman DB-G
gc- Hewlett-Pack 5750
lc- Altex 310
electoch- PAS 172,174,175
x-ray- Philips PW1008/80
at.abs.- Perkin Elmer

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 46 Computer literature search service? yes Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 10 .
4. Computer facilities: PDP 11-45 Time Sharing System with 6 terminals in Science Bldg.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $5,150
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: NSF-URP, $5,710 (4 participants); DuPont, $5,500; NSF-SOS
3. Faculty teaching loads: Contact hours 13 Load credit for research? NO
4. Sabbatical or leave support for research: sabbatical leave every 7 years; full year at ½ salary or 1-semester at full salary.

DANFORTH, JOSEPH D. (b. 1912) Professor A.B. 1934 Wabash College, Ph.D. 1938 Purdue University. *Inorganic Chemistry*. Structure and reactions of cracking catalysts, kinetics of thermal decomposition of polymers and inorganic solids.

ERICKSON, LUTHER E. (b. 1933) Professor and chairman B.A. 1955 St. Olaf College, Ph.D. 1959 University of Wisconsin. *Physical Chemistry*. Magnetic resonance spectroscopy, stereochemistry of coordination compounds. Eight publications 1973-78.

L. E. Erickson, *J. W. Cartmell and *N. G. Albrecht, A Proton NMR study of the Stereochemistry and Kinetics of the Reactions of DMSO with Potassium Dichloroglycinatoplatinate(II) and its Methyl Derivatives, *J. Coord. Chem.*, *5*, 135 (1976).

L. E. Erickson and *W. F. Hahne, Stereochemistry of the Reaction of Dimethylsulfoxide with Dichloroglycinatoplatinate(II) and Similar Amino Acids, *Inorg. Chem.*, *15* 2941 (1976).

J. E. Sarneski, A. T. McPhail, K. D. Onan, L. E. Erickson, and C. N. Reilley, Structural Characterization of a Novel Platinum(IV) Complex Produced by Deprotonation of Coordinated Amino Groups of the Rigid Ligand *cis*, *cis*-1,3,5-Triaminocyclohexane, *J. Am. Chem. Soc.*, *99*, 7376 (1977).

L. E. Erickson, J. E. Sarneski, and C. N. Reilley, Carbon-13 NMR Studies of Platinum(II) Complexes. 2. Chelate Ring Conformations and Internal Rotamer Distributions of Complexes of Methyl-Substituted Glycines, *Inorg. Chem.*, *17*, 1701 (1978).

L. E. Erickson, J. E. Sarneski, and C. N. Reilley, Carbon-13 NMR Studies of Platinum (II) Complexes. 3. Investigation of the Configuration and Ligand Conformation of Complexes of the Cyclic α-Amino Acids Proline and Pipecolic Acid, *Inorg. Chem.*, *17*, 1711 (1978).

Grants active: ACS-PRF, 1978-80, $12,000 - Stereochemistry of Metal Chelates.

GURIRA, ROGERS C. (b. 1942) Assistant Professor B.S. Central State University, Ph.D. 1973 Pennsylvania State University. *Analytical Chemistry*. Rates of electron transfer in heme proteins, electrochemistry of simple heme complexes, mechanisms of electron transfer processes in metal complexes.

PIPAL, ROBERT J. (b. 1945) Assistant Professor B.S. 1967 Iowa State University, Ph.D. 1971 Massachusetts Institute of Technology. *Inorganic Chemistry*. X-ray crystallography of inorganic and organometallic compounds, electrochemistry of cluster compounds. Seven publications 1973-78.

J.R. Pipal and R.N. Grimes, Tetracarbon Metallocarboranes. 4. Structure of the Nido System$(\eta^5\text{-}C_5H_5)Co(CH_3)_4C_4B_7H_6\text{-}OC_2H_5$. The Problem of the Structural Diversity of Electronically Analogous Cage Systems, *J. Am. Chem. Soc.*, *100*, 3083 (1978).

J.R. Pipal and R.N. Grimes, Crystal Structure of a Novel Triple-Decked Sandwich Metallocarborane, $\mu(2,3)\text{-}1,3\text{-}C_3H_4\text{-}1,7,2,3\text{-}(\eta\text{-}C_5H_5)2\text{-}Co_2C_2B_3H_3$, a Complex Containing a Bicyclic Planar Carborane Ligand Related to Pentalene. Partical Incorporation of a Cyclopentadienyl Ring into a Polyhedral Borane Cage, *Inorg. Chem.*, *17*, 10 (1978).

J.R. Pipal and R.N. Grimes, Tetracarbon Metallocarboranes. 3. Crystal Structure of a Closo 14-Vertex Cage, $1,14,2,5,9,12\text{-}(\eta\text{-}C_5H_5)2\text{-}Fe_2(CH_3)_4C_4B_8H_8$, a Bicapped Hexagonal Antiprism, *Inorg. Chem.*, *17*, 6 (1978).

J.R. Pipal and R.N. Grimes, Structures of Metalloboron Clusters. X-Ray Studies of Octahedral $(\eta^5\text{-}C_5H_5)_3Co_3B_3H_5)_3Co_3B_3H_5$and Capped Octahedral $(\eta^5\text{-}C_5H_5)_3Co_3B_4H_4$, a Boron Analogue of Tricobalt Carbon Clusters, *Inorg. Chem.*, *16*, 3255 (1977).

K. Wong, J.R. Bowser, J.R. Pipal, and R.N. Grimes, Tetracarbon Metallocarboranes. 5. A New Synthetic Route: Synthesis of $Co_2C_4B_6$ and CoC_4B_7 Nido Cage Systems by Fusion of Dicarbon Cobaltacarboranes in Ethanolic KOH. Crystal Structure of $(\eta^5\text{-}C_5H_5)_2Co_2C_4B_6H_{10}$, *J. Am. Chem. Soc.*, *100*, (1978).

TURNBULL, KENNETH (b. 1951) Assistant Professor B.S. 1973 Heriot-Watt University (Scotland), Ph.D. 1976 Heriot-Watt University. Organic Chemistry. Synthesis and reactions of mesoionic compounds, preparation of novel diazo compounds, investigation into the properties of stable thiosulfoxides. Seven publications 1973-78.

P. N. Preston and K. Turnbull, Synthesis and Reactions of Fused Ring Mesoionic Compounds, J. Chem. Soc. Perkin I, 1229 (1977).

I. W. J. Still, S. K. Hasan and K. Turbull, Phosphorous Pentasulfide as a Mild, Efficient Reducing Agent, Can. J. Chem., 56, 1423 (1978).

I. W. J. Still and K. Turnbull, Reaction of Sulfilimines with Phosphorous Pentasulfide, Synthesis, 540 (1978).

UHLENHOPP, ELLIOTT L. (b. 1942) Assistant Professor B.A. 1965 Carleton College, Ph.D. 1971 Columbia University. Biochemistry. Nucleic acid chemistry, physical biochemistry, viscoelastic measurement of high molecular weight DNA Solutions. Six publications 1973-78.

E. L. Uhlenhopp, B. H. Zimm, and D. C. Cummings, Structural Abberations in T-even Bacteriophage, J. Mole. Biol., 89, 689 (1974).

E. L. Uhlenhopp and B. H. Zimm, Viscoelastic Characterization of Single-Stranded DNA from E. Coli, Biophys. J., 15, 223 (1975).

E. L. Uhlenhopp, Viscoelastic Analysis of High Molecular Weight, Alkali-Denatured DNA from Mouse 3T3 Cells, Biophys. J., 15, 233 (1975).

E. L. Uhlenhopp, Rheology of Denatured Bacterial DNA Solutions, Biorheology, 12, 137 (1975).

*J. B. Williams, E. W. Fleck, *L. E. Hillier and E. Uhlenhopp, Viscoelastic Studies of Tetrahymena Macronuclear DNA, Proc. Natl. Acad. Sci., 75, (1978).

Grants Active: Research Corp., 1978-79, $7,000, Viscoelastic Analysis of Tetrahymena DNA.

WUBBELS, GENE C. (b. 1942) Associate Professor B.S. 1964 Hamline University, Ph.D. 1968 Northwestern University. Organic Chemistry. Photochemistry, mechanisms of photoreactions of aromatic molecules, catalysis of photoreactions, electron transfer reactions. Seven publications 1973-78.

G. G. Wubbels, *D. M. Tollelsen, *R. S. Meredith and *L. A. Herwaldt, Radical Intermediates in Photosubstitution Reactions of Anthroquinones, J. Am. Chem. Soc., 75, 3820 (1973).

G. G. Wubbels, *J. W. Jordan, and *N. S. Mills, Hydrochloric Acid Catalyzed Photoreduction of Nitrobenzene by n-Propanol. The Question of Protonation in the Excited State. J. Am. Chem. Soc., 95, 1281 (1973).

A. Padwa, T. Brookhart, D. Dehm, G. West, and G. Wubbels, Solvent Control of Migratory Aptitudes in the Photochemical Rearrangement of 2(5H)-Furanones, J. Am. Chem. Soc., 99, 2347 (1977).

G. G. Wubbels, Convenient, Degassable, Reusable Tubes for 'Merry-Go-Round' Photochemistry and General Vacuum Line Applications, J. Chem. Educ., 54, 49 (1977).

G. G. Wubbels, *W. J. Monaco, * D. E. Johnson, and *R. S. Meredith, Ammonia-Catalyzed Photoaddition of t-Butyl Alcohol to 9,10-Anthraquinone. Electron Transfer Catalysis of a Photochemical Hydrogen Abstraction Reaction, J. Am. Chem. Soc., 98, 1036 (1976).

Grants Active: ACS-PRF, 1978-80, $13,000 - Exiplexes in Photosubstitution Reactions.

HAMLINE UNIVERSITY

Saint Paul, MN., 55104

Fall 1978 ug enrollment~1190

Degrees offered B.A.

Telephone 641-2800

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary $\frac{1}{3}$ Stockrm $\frac{3}{4}$ Technician 0
3. 1978 seniors & their placement: Total 14 Grad. school 4 Industry 5 Professional schools 3 Other 2 .
4. Senior majors, average past five years: 12 .
5. Students involved in research, average past five years: Acad. yr. 9 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

   Fulbright Scholarship 1978

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 10,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR (Varian A-60A)
   AA (Beckman 448)
   IR (Beckman IR-12)
   GC (Varian 90-P)
   UV-Vis (Beckman DB and DU)
   SPF (Aminco-Bowman)
   MC (Home made)
   ES (Baird Atomic)
   HPLC (LDC Cheminert)

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No Total journal subscriptions? 15 Computer literature search service? Yes Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) None .

4. Computer facilities: Department; minicomputer, Dec LSI-11 and PDP-8E. Campus; Control Data 7700 Computer.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $3,000/yr. chemicals and glassware.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   Abbott Lab. Grant, $10,000. N.S.F. Equipment Grant, $7,000.

3. Faculty teaching loads: Contact hours 14 Load credit for research? Yes

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 7th year.

BENNETT, CHARLES R. (b. 1946) Assistant Professor, B.S., 1967, Tufts University, Ph.D., 1971, University of Georgia. Inorganic Chemistry. Synthesis of sterically hindered catalysts of unusual reactivity and model reactions for alkylmercury compound reactions in vivo.

C.R.Bennett and D.C.Bradley, Preparation of Bis(cyclopentadienyl)titano, trimethylsilylaza, dimethylsilylcyclobutane; a Novel Titanium Chelate Complex, J.C.S. Chem. Comm., p. 29, (1974).

C.R.Bennett and R.B.King, The Influence of Potentially Bridging Ligands in Homogeneous Catalytic Hydrogenation, Advances in Chem., 132, (1974).

CRESWELL, CLIFFORD J. (b. 1936) Professor and Chairman, B.S., 1958, Franklin and Marshall College, Ph.D., 1962, Northwestern University. Physical Chemistry. Effects of structure on barriers to rotation, line shape analysis in n.m.r., molecular dynamics of palladium, platinum and ruthenium complexes, thermodynamics of weakly interacting systems.

C.J. Creswell, J. Thomas Head and Olaf Runquist, Chemical Principles, 2nd edition, Burgess Publishing Co., (1974).

OLSEN, RODNEY L. (b. 1936) Professor, B.A., 1958 University of Minnesota, Duluth, Ph.D., 1962, Iowa State University. Analytical Chemistry. Fluorimetry and other methods of trace metal analysis; analytical applications of coordination chemistry.

R.F. Derr, R.L. Olsen, and L. Zieve, Separation of ^{32}P Labeled Inorganic Phosphate from Rat Liver Homogenatic, Anal. Biochem., 77, 548 (1977).

L. Zieve, and R.L. Olsen, Can hepatic coma be carried by a reduction of brain noradrenaline or dopamine?, Gut, 18, 688 (1977).

RUNQUIST, OLAF A. (b. 1931) Professor, B.S., 1952, Iowa State University, Ph.D., 1956, University of Minnesota. Organic Chemistry. Research interests: intramolecular hydrogen bonding; sulfonamides; reaction kinetics and chemical education.

J.W. Eaton, E. Berger, D. Nelson, J.G. White and O. Runquist, Intracellular Calcium: Lack of Effecton Ovine Red Cells (40086), Pro. Soc. Exp. Biol. & Med., 157, 406-510 (1978).

R. Giese, R. Mikulak and O. Runquist, Steriochemistry, An Introduction Programmed Text, Burgess Publishing Co., Minnesota, (1975).

R.B. Snadden and O.A. Runquist, Simulated Experiments, Education in Chemistry, 12, 75, (1975).

C.J.Creswell, J. Thomas Head, and O.A. Runquist, Chemical Principles, 2nd edition, BurgressPublishing Co., Minneapolis, (1974).

HAMPDEN-SYDNEY COLLEGE

Hampden-Sydney, VA 23943

Fall 1978 ug enrollment 735

Degrees offered B.S.

Telephone (804)223-4381

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2.Support staff: FTE's secretary 1/4 Stockrm 1/2 Technician 1/2
3. 1978 seniors & their placement: Total 11 Grad. school 3 Industry 1 Professional schools 7 Other 0 .
4. Senior majors, average past five years: 10 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

None.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 18,000 % used for teaching 60% Research 40%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR - 60 MHz (2) (PE R-24A; Varian A60D)
ESR - (2) (Varian V4500-12; Component Assembled ESR)
IR - (3) (2 PE 137B; PE 21)
UV - (2) (B&L 505; Beckman DK-2)
MS - (EAI Quad 250, heated inlet, Edwards Difstak, Oscillograph)
LC - (Component assembled)
GC - (5) (HP5711, F&M 700, 2 Carles; Nester-Faust 850 Prep. GC)
Three electrode cyclic voltammeter

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 20 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 10 .

4. Computer facilities: Department: DEC PDP-11 to be acquired in 1978-1979 with NSF ISEP support; Physics Dep't: PDP-11; College: IBM 1130.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $2,000/yr. chemicals and glassware; approx.$2,000/yr. equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
NSF-URP $7,200 NSF-ISEP $13,500
OE (State) Title VI $6,000 for LC instrumentation.
3. Faculty teaching loads: Contact hours 15 Load credit for research? No.

4. Sabbatical or leave support for research: Faculty are encouraged to apply for sabbatical leave at 50% salary for full year or 100% salary for 1/2 year.

PORTERFIELD, WILLIAM W. (b. 1936) Professor. B.S. 1957, University of North Carolina; M.S. 1960, California Institute of Technology; Ph.D. 1962, University of North Carolina. *Inorganic Chemistry*. Transition metals in fused-salt media; electronic and vibrational spectroscopy of transition-metal systems; redox reactivity of transition metal ions with oxy-donors.

D. D. Axtell, *Bennie W. Good, W. W. Porterfield, and J. T. Yoke, "Fused Salts" at Room Temperature. Vibrational Spectroscopic and Other Studies of Liquid Chlorocuprates(I), *J. Amer. Chem. Soc.*, *95*, 4555 (1973).

W. W. Porterfield and J. T. Yoke, Room Temperature Fused Salts: Liquid Chlorocuprates(I), *Inorganic Compounds with Unusual Properties* (Adv. Chem. 150, R. B. King, ed.) American Chemical Society, 1976.

SIPE, HERBERT J., JR. (b. 1940) Associate Professor and Chairman. B.S. 1962, Juniata College; Ph.D. 1969, University of Wisconsin. *Physical Chemistry*. Structure and bonding studies in Group IVA organometallic compounds; electron spin resonance spectroscopy.

H. J. Sipe, Jr. and R. West, Electron Spin Resonance Studies of Group IV Organometallic Radical Anions. I. Organometal-substituted benzenes, *J. Organometal. Chem.*, *70*, 353 (1974).

H. J. Sipe, Jr. and R. West, Electron Spin Resonance Studies of Group IV Organometallic Radical Anions. II. Organometal-substituted Alkylbenzenes., *J. Organometal. Chem.*, *70*, 367 (1974).

H. J. Sipe, Jr. and J. Y. Corey, Electron Spin Resonance Studies of Radical Anions of Group IV Dibenzo[b,f]metallepins, *J. Organometal. Chem.*, *120*, 195 (1976).

Grants active 1977-1978: NSF-URP $7,200

SMITH, HOMER A., JR. (b. 1932) Professor. B.A. 1953, Rice University; Ph.D. 1961, Oklahoma State University. *Organic Chemistry*. Multiple anions in synthesis; medicinal chemistry.

E. Campaigne and H. A. Smith, Jr., 3-Methyl-5-hydroxybenzo[b]thiophene, *Heterocyclic Syntheses*, *1*, 0000 (1979).

D. Caine, S. T. Chao, and H. A. Smith, Jr., Enone Reduction-Enolate Alkylation Sequence: 2-Allyl-3-methylcyclohexanone, *Organic Syntheses*, *56*, 52 (1977).

H. A. Smith, Jr., The Evolution of a Self-Paced Organic Chemistry Course, *J. Chem. Educ.*, *53*, 510 (1976).

H. A. Smith, Jr., A Self-Paced Course in Organic Chemistry, Proceedings of the Symposium on Self-Paced Instruction in Chemistry, B. Z. Shakhashri, Ed., Chemical Education Publishing Co., Easton, PA, 1973, p.47.

THOMPSON, DOUGLAS S. (b. 1939) Associate Professor. B.S. 1961, University of California (Berkeley); Ph.D. 1965, Massachusetts Institute of Technology. *Analytical and Biophysical Chemistry*. Polymer Characterization; physical chemistry of phospholipid bilayer vesicles.

D. S. Thompson and R. L. Jernigan, Molecular Electro-optics of Flexible Polymers, in *Molecular Electro-optics*, C. T. O'Konski, Ed., Marcel Dekker Publishing Co., N.Y., 1976.

D. S. Thompson, Spectrophotometric formaldehyde-copper monitor. U.S. 3, 951, 602 (patent issued April 20, 1976).

H. R. Massie, D. S. Thompson and L. J. Colarusso, Discontinuous DNA Replication and Molecular Events Preceding DNA Replication in *Bacillus subtilis*, *Arch. Biochem. and Biophysics*, *167*, 213 (1975).

Grant active 1977-1978: OE (State) Title VI $6,000 for LC instrumentation.

HARVEY MUDD COLLEGE
Claremont, CA 91711

Fall 1978 ug enrollment 483
Degrees offered B.S.
Telephone (714) 621-8092

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician
3. 1978 seniors & their placement: Total 18 Grad. school 13 Industry 3 . Professional schools 2 Other .
4. Senior majors, average past five years: 16 .
5. Students involved in research, average past five years: Acad. yr. 16 Summer 12
6. National student honors, past five years (NSF fellowships, etc.)
   NSF - 3, Hertz 1, Watson 1

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 19,000 % used for teaching all Research 16%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)
   Finnigan 3200 Gas Chromatograph/Mass Spectrometer; Varian HA 100 and EM 360L nmr spectrometers with low temperature and decoupling accessories; Perkin-Elmer Model 621 and Model 137B ir spectrophotometers; Cary Model 13MS, Cary Model 16K, Beckman DK-2 and DU, Varian 580 vis-uv spectrophotometers; Picker Automatic X-ray Diffractometer, General Electric Spectrogoniometer.
3. Library resources:/ Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 250 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 70 .
   (in Claremont Colleges, all used by HMC)
4. Computer facilities: Data General Nova 2 Minicomputer and an IBM 360/40 computer at the Claremont Colleges Computer Center. Access to terminals of Claremont Colleges time-shared PDP 10 computer.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   $10,000/yr plus large capital equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Dreyfus - $12,000; du Pont - $6500; NSF - $15,000; Title VI - $30,000; plus individual faculty research grants, about $30,000/yr.
3. Faculty teaching loads: Contact hours 10-13 hrs/wk Load credit for research? Yes but not included in contact hours.
4. Sabbatical or leave support for research:
   80% pay for sabbatical every 7th year.

FACULTY PROFILE

CAMPBELL, J. ARTHUR (b. 1916) Professor. A.B., 1938, Oberlin College, Ph. D., 1942, University of California, Berkeley. Physical Chemistry. Structural Chemistry.

ECO-CHEM monthly column, J. Chem. Ed.

Chemistry, The Unending Frontier, Goodyear Publishing Company, 1978

DAUB, G. WILLIAM (b. 1950) Assistant Professor. B. S. 1972, Pomona College, Ph. D., 1977, Stanford. Organic Chemistry. The development of new synthetic techniques and their applications in natural product synthesis.

G. W. Daub, Oxidatively Induced Cleavage of Transition Metal-Carbon Bonds, Progress in Inorganic Chemistry, 22, 409 (1977).

G. W. Daub and E. E. van Tamelen, Synthesis of Oligoribonucleotides Based on the Facile Cleavage of Methyl Phosphotriester Intermediates, J. Am. Chem. Soc., 99, 3526 (1977).

KOK, GREGORY L. (b 1947) Assistant Professor. B.S. 1969 Calvin College, Ph. D., 1973, University of Michigan. Analytical Chemistry. Application of Chemiluminescent Analytical Techniques for the Determination of Trace Air Pollutants.

Gregory L. Kok and T. P. Holler, Chemiluminescent Method for the Determination of Hydrogen Peroxide in the Ambient Atmosphere, Environ. Sci. Technol., 12 1072 (1978).

Gregory L. Kok, K. R. Darnall, A. M. Winer, J. N. Pitts, Jr., and B. W. Gay, Ambient Air Measurements of Hydrogen Peroxide in the California South Coast Air Basin, Environ. Sci. Technol., 12, 1077 (1978).

Grants Active: NSF, $3,600; FAA, $97,000.

KUBOTA, MITSURU (b 1932) Professor. B.S., 1954 , University of Hawaii, Ph. D., 1960, University of Illinois. Inorganic Chemistry. Coordination and Organometallic Chemistry.

Mitsuru Kubota, K. J. Evans, C. A. Koerntgen and J. C. Marsters, Jr., Reduction of Nitric Oxide by Carbon Monoxide in the Presence of Aqueous Palladium(II) and Copper(II), J. Am. Chem. Soc., 100, 342 (1978).

Mitsuru Kubota, C. A. Koerntgen and G. W. McDonald, Oxidative Addition of Nitrogen(IV) Oxide to Complexes of Platinum, Iridium, and Rhodium, Inorg. Chim. Acta, 30, 119 (1978).

Grants Active: Research Corporation, $8,000; PRF, $13,000.

MYHRE, PHILIP C. (b. 1933) Professor. B. A., 1954 Pacific Lutheran College, 1958 University of Washington. Organic Chemistry. Study of Ipso Reactions.

Philip C. Myhre and C. Barnes, Ipso Nitration. Characterization of Nitro Group Shifts in 4-Methyl-4-nitrocyclohexadienones, J. Am. Chem. Soc., 100, 973 (1978).

Philip C. Myhre and C. Barnes, Ipso Nitration. A Study of the Migratory Apptitude of the Nitro Group in the 1,2-Dimethyl-1-nitrocyclohexadienyl Cation, J. Am. Chem. Soc., 100, 975 (1978).

Grants Active: Research Corporation, $5,650; PRF, $13,000.

SLY, WILLIAM G. (b. 1922) Professor. B.S., 1951 San Diego State College, Ph.D. 1955 California Institute of Technology. *Physical Chemistry*. Crystallography.

VAN EIKEREN, PAUL (b. 1946) Associate Professor. B. S. 1968 Columbia College, Ph. D. 1971 Massachusetts Institute of Technology. *Bioorganic Chemistry*. Bioorganic Chemistry. Mechanisms of Enzymatic Reactions.

Paul van Eikeren and David Grier, Models for NADH Coenzyme, Isotope Effects in the N-Benzyldihydronicotinamide/N-Benzylnicotinamide Salt Transhydrogenation Reaction, *J. Am. Chem. Soc.*, *99*, 8057 (1977).

Paul van Eikeren and David Grier, Models for NADH Dependent Enzymes. Solvent Effects in Dihydronicotinamide Reductions, *J. Am. Chem. Soc.*, *98*, 4655 (1976).

Grants Active: Research Corporation, $19,205; PRF, $11,000.

VAN HECKE, GERALD R. (b. 1939) Associate Professor. B. S. 1961 Harvey Mudd College, Ph. D. 1966 Princeton University. *Physical Chemistry*. Physical Properties of Liquid Crystals.

Gerald R. Van Hecke and L. J. Theodore, Dilatometry of Binary Nematogenic Mixtures: Homologous 4-*n*'-Pentanoyl- and 4-*n*'-Nonanoyl-4-ethoxyazobenzenes, *J. Phys. Chem.*, *82*, 1669 (1978).

Gerald R. Van Hecke, L. J. Theodore, and B. D. Santarsiero, Physical Studies of Homologous *trans*-4-Ethoxy-4'-*n*-alkanoyloxyazobenzenes: Birefringence, *Mol. Cryst. Liq. Cryst.*, *45*, 1 (1978).

Grants Active: Research Corporation, $8,630; PRF, $11,000.

HAVERFORD COLLEGE
Haverford, PA 19041

Fall 1978 ug enrollment 950
Degrees offered B.A., B.S.
Telephone (215) 649-9600 x341

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 1 Stockrm 1/2 ~~Technician~~ Machinist 1/3
3. 1978 seniors & their placement: Total 17 Grad. school 5 Industry ____ Professional schools 8 Other 4 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

NSF: one each in 1974, 1975, 1977, 1978

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 15,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR - 60 MHz (PE R-12)
MS (PE Hitachi RM 50)
GC (PE 3920 for MS; F&M 5750)
UV-Vis (Cary 118, PE Coleman 124)
Liq. Sci. (Packard Tri-Carb 3320)
HPLC (Waters)
IR (PE 237B)
FS (PE MPF-3L)
X-Ray Generator
Weissenberg and Precession Cameras (NONIUS Y-925, SUPPER 9000-W)

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? Yes Total journal subscriptions? 36 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 22 .

4. Computer facilities: Department: PDP11-03 equipped with graphics terminals (DECVT55 and HP2648A), decwriter II teletype and A/D interface; Wang 720B prog. calc. Campus: IBM 360/44 with disc and tape drives.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $4000/yr. chemicals and glassware; $3500 equipment maintenance

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
du Pont College Science Grant $6,500 Dreyfus $15,000 for computer
NSF-URP $6,300

3. Faculty teaching loads: Contact hours 12 Load credit for research? Yes

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, 100% salary for 1/2 year, after 12 semesters' service.

CHESICK, JOHN P. (b.1933) Professor. B.S., 1954, Purdue University, Ph.D., 1957, Harvard University. _Physical Chemistry_. Chemical kinetics and molecular structure.

Thirteen publications, 1973-1978.

J.P. Chesick (with *Robert Stabler), A Program System for Computer Integration of Multistep Reaction Rate Equations Using the Gear Integration Method, _Int. J. of Chem. Kn._, _55_, 461 (1978).

J.P. Chesick (with D.E. Koshland and *S.E. Myers), The Crystal Structures of 1,3,5-Trimethylbenzenetricarbonylmolybdenum and Hexamethylbenzenetricarbonylbdenum, _Acta Cryst._, _B33_, 2013 (1977).

J.P. Chesick (with *Michael D. Morse), 1,2 _trans_ Diaminocyclohexane Hydrobromide, _Acta Cryst._, _B32_, 954 (1976).

J.P. Chesick (with W.C. Davidon and *Chadmark Schoen), Application of a New Least Squares Method to Structure Refinement, _Acta Cryst._, _A32_, 120 (1976).

J.P. Chesick (with Jack D. Dunitz, Ulrich Gizycki, and Hans Musso), Synthese und Struktur von Tetramethyltetraasteranen, _Chemische Berichte_, _vol. 106_, 150 (1973).

GAVIN, ROBERT M., JR. (b.1940) Professor. B.A., 1962, St. Johns University; Ph.D., 1966, Iowa State University. _Physical Chemistry_. Molecular structure, spectroscopy, chemical bonding; photochemistry of vision.

R.M. Gavin, Jr., *Charles Weisman, Jeffrey K. McVey, and Stuart A. Rice, Spectroscopic Properties of Polyenes. III. 1,3,5,7 Octatetraene, _J. Chem. Phys._, _68_, 522 (1978).

Jean W. Laing, Mark G. Sceats, Stuart A. Rice, and R.M. Gavin, A Simulation of the Conformation of All-Trans Retinal by Transfer of Local Conformations, _Chem. Phys. Letters_, _41_, 419 (1976).

R.M. Gavin, Jr., and S.A. Rice, Spectroscopic Properties of Polyenes, II. The Vacuum Ultraviolet Spectra of _Cis_ and _trans_-1,3,5 Hexatriene, _J. Chem. Phys._, _60_, 3231 (1974).

R.M. Gavin, Jr. and Z.F. Wang*, An Electron Diffraction Study of trans-cycloctene, _J. Am. Chem. Soc._, _95_, 1425 (1973).

R.M. Gavin, Jr., S. Risemberg, and S.A. Rice, Spectroscopic Properties of Polyenes, I. The Lowest Energy Allowed Singlet-Singlet Transition for _Cis_ and _trans_-1,3,5 Hexatriene, _J. Chem. Phys._, _58_, 3160 (1973).

Grants active 1977-78: Dreyfus Teacher-Scholar Grant, $18,000.

LERMAN, CHARLES L. (b.1948) Assistant Professor. B.S., 1969, Yale U., Ph.D., 1974, Harvard U. _Physical Organic and Bio-organic Chemistry_. Enzyme mechanisms, enzyme models.

C.L. Lerman, An Effective Demonstration of the Behavior of Indicators and Biochemicals in Buffers, _J. Chem. Educ._, _53_, 634 (1976).

C.L. Lerman and F.H. Westheimer, Ionization of Oxyphosphoranes. Phosphonium Ions and Hexacoordinated Phosphorus Anions, _J. Amer. Chem. Soc._, _98_, 179 (1976).

P.D. Bartlett, A.L. Baumstark, M.E. Landis, and C.L. Lerman, Phosphorane Formation from the Reaction of Trivalent Phosphorus Compounds with Tetramethyl-1,2-dioxetane, _J. Amer. Chem. Soc._, _96_, 5267 (1974).

Grants active 1978-79: NIH Active Site of δ-Aminolevulinic Acid Dehydratase, $107,386; Petroleum Research Fund, Mechanism of Action of 5-Aminolevulinic Acid Dehydratase, $9000.

MAC KAY, COLIN F. (b.1926) Professor. B.S., 1950, University of Notre Dame; M.S., 1953, Ph.D., 1956, University of Chicago. Physical Chemistry. Atomic chemistry and photochemistry; hot atom chemistry.

Colin MacKay and W.T. Rose, Effect of Electronic State of Carbon Atoms on Their Reactions with Cyclopentadiene in Inert Gas Moderated Systems, J. Am. Chem. Soc., 99, 4917 (1977).

Colin MacKay, Some Primary Reactions of Free Carbon Atoms and Related Chemistry of C_2, C_3, and C_2O, Carbenes, Vol. II (R.A. Moss and M. Jones, Jr., eds.), John Wiley (1975).

Colin MacKay and W.T. Rose, On Abstraction or Stripping of CH_2 as a Route to Acetylene Formation in Hot Carbon Atom Reaction, J. Am. Chem. Soc., 77, 2598 (1973).

Grant Active: Research Corporation, 1977-79, $13,000.

MEHRETEAB, AMMANUEL (b.1945) Assistant Professor. B.A., 1970, Central College, Iowa; M.S., 1973, Ph.D., 1977, Rutgers University. Physical Chemistry. Energy transfer in membranes.

A. Mehreteab and G. Strauss, Energy Transfer and Energy Losses in Bilayer Membrane Vesicles (Liposomes), Photochemistry and Photobiology, 28, 369 (1978).

G. Strauss and A. Mehreteab, Energy Transfer and Energy Losses in Bilayer Lipid Membranes (Liposomes), Biophysical Journal, 21, 127a (1978).

REINGOLD, I. DAVID (b.1949) Assistant Professor. A.B., 1971, Dartmouth College; Ph.D., 1976, University of Oregon. Organic Chemistry. Organic synthesis: theoretically interesting compounds.

J.M. Townsend, I.D. Reingold, M.C.R. Kendall and T.A. Spencer, Dehydrobromination of α-Bromo Ketones with Palladium Tetrakis-(triphenylphosphine), J. Org. Chem., 40, 2976 (1975).

V. Boekelheide, I.D. Reingold and M. Tuttle, Syntheses of Cyclophanes by Photochemical Extrusion of Sulfur, J. C. S. Chem. Comm., 406 (1973).

WINTNER, CLAUDE E. (b.1938) Professor and Chairman. A.B., 1959, Princeton University; M.A., 1960, Ph.D., 1963, Harvard University. Organic Chemistry. Organic synthesis; chemistry of the azo group.

Albert Eschenmoser and Claude E. Wintner, Natural Product Synthesis and Vitamin B_{12}, Science, 196, 1410 (1977).

Robert K. Müller, Renato Joos, Dorothee Felix, Jakob Schreiber, Claude Wintner, and A. Eschenmoser, The Preparation of N-Aminoaziridines, Organic Syntheses, 55, 114 (1976).

Dorothee Felix, Claude Wintner, and A. Eschenmoser, The Fragmentation of α,β-Epoxyketones to Acetylenic Aldehydes and Ketones, Organic Syntheses, 55, 52 (1976).

COLLEGE OF THE HOLY CROSS

Worcester, MA 01610

Fall 1978 ug enrollment 2,570

Degrees offered B.S. and M.S.

Telephone (617) 793-3379

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9 . 2. Support staff: FTE's secretary 1½ Stockrm 3 Technician 0
3. 1978 seniors & their placement: Total 46 Grad. school 16 Industry 7 Professional schools 11 Other 12 .
4. Senior majors, average past five years: 33 .
5. Students involved in research, average past five years: Acad. yr. 25 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 16,000 % used for teaching 70% Research 30%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 6MHz (P.E. R-20)
UV-Vis - (DK-2A)
HPLC (Waters ALC-240)
AA (P.E.-103)
G.C. (Varian-200, Gow-Mac-150)
I R (P.E.-457)
Fluorescence Spectrophotometer
Flash Photolysis

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 42 Computer literature search service? yes Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 16 .
4. Computer facilities: Department HP 9820A Programmable (with BCD interface) and HP 9862A Plotter; Campus IBM-370/125 and Digital Equipment Corp. Vax 11/780

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $9,000/yr. (expendables) $7,000/yr. (equipment)
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 13 Load credit for research? yes
4. Sabbatical or leave support for research:
   Sabbatical - every 7 years 80% salary full/yr, full salary ½ yr.
   Faculty Fellowship - anytime if approved 80% salary full/yr, full salary ½ yr.

BROWN, JOYCE E. (b. 1943) Visiting Lecturer, B.A., 1965, University of New Hampshire, Ph.D., 1970, Johns Hopkins University. Theoretical Chemistry.

BYERS, BLAINE H. (b. 1948) Assistant Professor. B.A., 1970, Ohio Wesleyan University, Ph.D., 1975, University of Illinois. Inorganic Chemistry. Kinetics and mechanisms of substitution reactions in group VII metal carbonyl hydride complexes.

B.H.Byers and T.L.Brown, Transition Metal Carbonyl Substitution via a Radical Chain Pathway, J. Amer. Chem. Soc., 97, 947(1975).

B.H.Byers and T.L.Brown, Activation of Molecular Hydrogen by a Transition Metal Carbonyl Radical Species, J. Amer. Chem. Soc., 97, 3260(1975).

B.H.Byers and T.L.Brown, The Characteristics of $M(CO)_5$ and Related Metal Carbonyl Radicals: Abstraction, Dissociative and Oxidative Addition Processes, J. Amer. Chem. Soc., 99, 2527(1977).

B.H.Byers and T.L.Brown, On the Mechanisms of Substitution of Hydridopentacarbonylmanganese(I), J. Organomet. Chem., 127, 181(1977).

DEAKYNE, CAROL A. (b. 1949) Assistant Professor. B.S., 1971, Rider College, M.S., 1972, Carnegie-Mellon University, Ph.D., 1976, Princeton University. Theoretical Chemistry. Electronic structure analysis via molecular orbital theory of organic, physical and biochemical problems.

C.A.Deakyne and L.C.Allen, Nucleophilic Additions to Phosphine Oxides. A Model Study of Anionic Trigonal Bipyramidal Intermediates, J. Am. Chem. Soc., 98, 4076(1976).

C.A.Deakyne, L.C.Allen and V.W.Laurie, Bond Length Changes Resulting from Substitution and Ring Opening in Three-Membered Systems, J. Am. Chem. Soc., 99, 1343(1977).

C.A.Deakyne, N.C.Craig and L.C.Allen, Bond Length Changes Resulting from Halogen Substitution on Three-Membered Rings, J. Am. Chem. Soc., 99, 3895(1977).

A.Warshel and C.A.Deakyne, Coupling of Charge Stabilization,Torsion, and Bond Alternation in Light-Induced Reactions of Visual Pigmanets, Chem. Phys. Lett., 55, 459(1978).

INGLEFIELD, PAUL T. (b. 1940) Visiting Lecturer. B.Sc., 1962, University of Glasgow, Ph.D., 1967, University of British Columbia. Physical Chemistry. Nuclear Magnetic Resonance, Structure and Dynamics.

P.T.Inglefield, K.A.Lindblom and A.M.Gottlieb, Water Binding and Mobility in Phosphatidylcholine-Cholesterol-Water Lamellar Phase, Biochim. et Biophys. Acta, 419, 196(1976).

Y.C.Hsieh, P.T.Inglefield and W.Y.Wen, Proton Chemical Shifts of Water in Aqueous Triethylenediamine. Cosphere Model and Temperature Dependence, J. Soln.Chem. 3, 351(1974).

McGRATH, MICHAEL G. (b. 1941) Associate Professor. B.S., 1963, College of the Holy Cross, Ph.D., 1967, Massachusetts Institute of Technology. Organic Chemistry. Organic synthesis and small-ring compounds; education of the pre-health professional student.

McMASTER, PAUL D. (b. 1932) Associate Professor, Chairman. B.S., 1954, College of the Holy Cross, Ph.D., 1961, Clark University. Organic Chemistry.Conformational analysis, drug design (Consultant Astra Pharmaceutical Products).

RICCI, ROBERT W. (b. 1934) Associate Professor. B.S., 1956, Boston College, Ph.D., 1961, University of New Hampshire. Physical Chemistry. Photophysics of aromatic compounds.

D. Busch, L. Dahm, B. Siwicke and R.W.Ricci, Singlet-Quenching of Photoexcited Aromatics by Carbonyl Compounds, Tetrahedron Letters, 51, 4489(1977).

R.W.Ricci and J. Nesta, Inter- and Intramolecular Quenching of Indole Fluorescence by Carbonyl Compounds, J. Phys. Chem., 80, 974(1976).

R.W.Ricci and K. Killichowski, Fluorescence Quenching of the Indole Ring System by Lanthanide Ions, J. Phys. Chem., 78, 1953(1974).

R.W.Ricci, Determination of the Activation Energy of a Non-Radiative Decay Manifold, J. Chem. Ed., 51, 692(1974).

Grant Active: PRF-B, 1976-78, $11,000.

VELLACCIO, FRANK, JR. (b. 1948) Associate Professor. B.A., 1970, Fordham University, Ph.D., 1974, Massachusetts Institute of Technology. Organic Chemistry. Methods in biochemistry-peptide synthesis.

F.Vellaccio, Jr., R.V.Punzar and D.S.Kemp, Reaction of Dialkylmalonyl Dichlorides with 1,3-Diamenopropanes-A New Route to Macrocyclic Polyamides and Polyamines, Tetrahedron Letters, 6, 547(1977).

F.Vellaccio, Jr., and D.S.Kemp, Anomalously Large Steric Inhibition of Intramole O,N Acyl Transfer to Amine Acid Esters, J. Org. Chem., 40, 3464(1975).

F.Vellaccio, Jr., and D.S.Kemp, Rapid Intramolecular Acyl Transfer from Phenol to Carbinolamine-Progress Toward a New Class of Peptide Coupling Reagent, J. Org. Chem., 40, 3003(1975).

Grant Active: Research Corporation, 1977-79, $6,000.

VIDULICH, GEORGE A. (b. 1931) Associate Professor. B.A., 1959, University of Connecticut, Ph.D., 1964, Brown University. Physical Chemistry. Structure and properties of water and aqueous electrolyte and non-electrolyte solutions. Metal ion solvation by NMR spectroscopy. Precipitation chemistry.

G.A.Vidulich and A. Fratiello, A Room Temperature Proton Magnetic Resonance Hydration Number Study, J. Chem. Ed., 55, 672 (1978).

A. Fratiello, R. Kubo, D. Liu and G.A.Vidulich, A Direct Carbon-13 Nuclear Magnetic Resonance Study of Boron Trifluoride and Boron Trichloride Complexes with Ethers, J. Chem. Soc., Perkins Trans. II, 1415(1975).

A. Fratiello, G.A.Vidulich and F. Mako, A Direct Nuclear Magnetic Resonance Cation Hydration Study of Zirconyl Perchlorate and Zirconyl Nitrate Solutions in Water-Hexamethylphosphoramide-Acetone Mixtures, Inorg. Chem., 12, 470(1973).

G.A.Vidulich, G.P.Cunningham and R.L.Kay, Transference Numbers for Anhydrous Methanol Solutions at 10 and 25°C, J. Soln. Chem., 2, 23(1973).

HOPE COLLEGE

Holland, MI 49423

Fall 1978 ug enrollment 2100

Degrees offered B.A.

Telephone (616) 392-5111

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 42 Grad. school 16 Industry 7 Professional schools 13 Other 6 .
4. Senior majors, average past five years: 34 .
5. Students involved in research, average past five years: Acad. yr. 40 Summer 30
6. National student honors, past five years (NSF fellowships, etc.)

   Five NSF Graduate Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 22,000 % used for teaching 67 Research 33
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   Varian FT-80A Pulse Fourier transform NMR spectrometer with switchable $^{13}C/^{1}H$ and broadband probes, variable temperature accessory, single Sykes Floppy disc, and multiple probe inserts; Finnegan Model 1015 GC-Mass Spectrometer; P-E Model 621 high resolution infrared spectrometer; NRG 1 MW nitrogen laser and IMSAI microcomputer; Perkin-Elmer Model 241 spectropolarimeter; Perkin-Elmer Model 303 atomic absorption spectrophotometer; GCA/McPherson Model EU-700 spectrophotometer/kinetic system; Cary 14 spectrophotometer; DuPont/Sorvall OTD-50 ultracentrifuge; Chromatec Model 3120 liquid chromatography system, Chromatec.

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 72 Computer literature search service? yes Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 29 .

4. Computer facilities: Department - Nuclear Data 812 minicomputer with cass. tape storage and CRT graphics; IMSAI 8080A microcomputer with videoterminal.C.-Xerox Sigma Six, 48K core, Tetronix graphics terminal, and Calcomp plotting services.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Instrument maintenance ($4,000); all common instrumental supplies, solvents, gases, and laboratory equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Dreyfus Foundation Innovation in Education in Chemistry ('77-79) $27,740; NSF Chemistry Research Instrumentation Program (1978), $55,000; Du Pont Science Grant, $6,500; Johnson's Wax Fund Departmental Grant, $2,000.
3. Faculty teaching loads: Contact hours 11 Load credit for research? 25% time allotted for research activities with undergraduate students.
4. Sabbatical or leave support for research:

   Faculty are eligible for sabbatical leave after completion of six years of faculty employment; full salary for 1/2 year or 50% salary for full year.

FACULTY PROFILE

BOYER, RODNEY F. (b. 1942) Associate Professor. B.A., 1964, Westmar College, M.S. 1967, Ph.D., 1969, Colorado State University. Biochemistry. Biological hydroxylation, neurochemistry of 2-hydroxyfatty acids, metal-ion-facilitated reactions of bimolecules, enzymatic hydrolysis of cellulose.

R.F. Boyer, "A Spectrophotometric Assay of Polyphenoloxidase Activity", J. Chem Ed., 54, 585 (1977).

R.F. Boyer, *C.G. Lindstrom, *B. Darby, and *M. Hylarides, "The Peracid Oxidation of Singlet Oxygen Acceptors", Tetrahedron Lett., No. 47, 4111 (1975).

R.T. Ruettinger, S.T. Olson, R.F. Boyer and M.J. Coon, "Identification of the ω-Hydroxylase of Pseudomonas Oleovorans as a Nonheme Iron Protein Requiring Phospholipid for Catalytic Activity", Biochem. Biophys. Res. Comm., 57, 1011 (1974).

M.J. Coon, H.W. Strobel and R.F. Boyer, "Studies on the Mechanism of Enzyme Catalyzed Hydroxylation", Drug Metabolism and Disposition, 1, 92 (1973).

M.J. Coon, A.P. Autor, R.F. Boyer, E.T. Lode, and H.W. Strobel, "On the Mechanism of Fatty Acid, Hydrocarbon, and Drug Hydroxylation in Liver, Microsomal, and Bacterial Enzyme Systems", in International Symposium on Oxidases and Related Oxidation-Reduction Systems, King, Mason, and Morrison, Eds., University Park Press, Baltimore, Md., 1973.

Grants active 1977-78: NIH, 1976-79, $25,000 - 2-Hydroxyfatty Acids: Metabolism in Rat Brain. Research Corp., 1978-79, $9,000 - 2-Hydroxyacid Oxidase Activity Associated with Rat Brain Peroxisomes.

BRINK, IRWIN J. (b. 1930) Professor. A.B., 1952, Hope College, Ph.D., 1957, University of Illinois. Physical Chemistry. Thermodynamics of molecular crystals, detection of and fate of halogenated hydrocarbons in the environment.

I.J. Brink and C.E. Holley Jr., "The Enthalpy of Formation of Strontium Monoxide", J. Chem. Thermodynamics, 259-266 (1978).

DOYLE, MICHAEL P. (b. 1942) Professor and Chairman. B.S., 1964, College of St. Thomas, Ph.D., 1968, Iowa State University. Henry and Camille Dreyfus Foundation Teacher-Scholar Awardee, 1973-1978. Organic Chemistry. Formation and reactions of dinitrogen compounds; organosilane reductions; electron transfer reactions; synthetic methods in Lewis acid and transition metal catalyzed processes; mechanisms of organic reactions.

Thirty-five publications, 1973-1978, and two books.

M.P. Doyle, *M. Oppenhuizen, *R.C. Elliott, and *M.R. Boelkins, "Lewis Acid-Promoted 1,3-Dipolar Addition Reactions of Diazocarbonyl Compounds. A General Synthesis of Oxazoles", Tetrahedron Lett., 2247 (1978).

M.P. Doyle and *C.C. McOsker, "Silane Reductions in Acidic Media. 10. Ionic Hydrogenation of Cycloalkenes. Stereoselectivity and Mechanism", J. Org. Chem., 43, 693 (1978).

M.P. Doyle, *J.F. Dellaria, Jr., B. Siegfried, and *S.W. Bishop, "Reductive Deamination of Arylamines by Alkyl Nitrites in N,N-Dimethylformamide. A Direct Conversion of Arylamines to Aromatic Hydrocarbons", J. Org. Chem., 42, 3494 (1977).

M.P. Doyle and *D.M. Hedstrand, "Reversible Oxidation of 1,3-Dithiolan-2-thione", J. Chem. Soc., Chem. Comm., 643 (1977).

M.P. Doyle, *J.L. Whitefleet, *D.J. DeBruyn, and *W. Wierenga, "Decarboxylations of Azodicarboxylates by Nitrosonium and Nitronium Salts. Decarboxylative Oxidation and Substitution Reactions", J. Am. Chem. Soc., 99, 494 (1977).

Grants active 1977-78: NSF, 1976-79, $62,700 - Reactions of Coordinated Metal Nitrosyls and Nitrosonium Salts. Res. Corp., 1978-80, $9,600 - Electron Transfer Mediated by Metal Templates. Dreyfus Foundation, 1973-78, $18,000 - Teacher-Scholar Grant Award.

FRIEDRICH, DONALD M. (b. 1944) Assistant Professor. B.S., 1966, University of Michigan, Ph.D., 1973, Cornell University. Physical Chemistry. Spectroscopy of organic compounds and free radicals; excited state structures and force fields; rotational relaxation in solution.

Nine publications. 1973-1978.

D.M. Friedrich, "Gaussian Optics-Program for SR-52", Optical Spectra, 12:4, 64 (1978).

*S.A. Sprik and D.M. Friedrich, "A Versatile and Inexpensive Lens Holder for Optics Experiments", J. Chem. Ed., 54, 768 (1977).

J.R. Lombardi, R. Wallenstein, T.W. Hansch, D.M. Friedrich, "High Resolution Two-Photon Spectroscopy in the $^1B_{2u}$ State of Benzene", J. Chem. Phys., 65, 2357 (1976).

J.R. Lombardi, D.M. Friedrich, and W.M. McClain, "Rotational Contours and Isotope Effects in the Two-Photon Excitation of Benzene Vapor", Chem. Phys. Letters, 38, 213 (1976).

D.M. Friedrich and W.M. McClain, "Polarization and Assignment of the Two-Photon Excitation Spectrum of Benzene Vapor", Chem. Phys. Letters, 32, 541 (1975).

Grants active 1977-78: Research Corporation, 1977-1978, $16,500 - Multiphoton Spectroscopy of Organic Molecules. PRF, 1976-78, $9,000 - Multiphoton Laser Studies of Excited States of Organic Molecules.

JEKEL, EUGENE C. (b. 1930) Professor. A.B., 1952, Hope College, M.S., 1955, Ph.D., 1964, Purdue University. Inorganic Chemistry. Chemical education, teacher development projects for high school chemistry teachers, pre-medical education and advising.

Grants active 1977-78: NSF, 1978, $29,711 - Summer Pre-College Teacher Development Project in Chemistry.

KLEIN, DAVID H. (b. 1933) Professor. A.B., 1954, Albion College, Ph.D., 1959, Case Institute of Technology. Analytical Chemistry. Environmental chemistry of metals, especially mercury. Atmospheric sources of metals and atmosphere-earth transfers.

D.H. Klein, A.W. Andren, and N.E. Bolton, "Trace Element Discharges from Coal Combustion for Power Production", Water, Air, and Soil Pollution, 5, 71 (1975).

D.H. Klein, "Fluxes, Residence Times, and Sources of Some Elements to Lake Michigan", Water, Air, and Soil Pollution, 4, 3 (1975).

D.H. Klein et al., "Pathways of Thirty-Seven Trace Elements through a Coal-Fired Power Plant", Environ. Sci. and Tech., 9, 973 (1975).

D.H. Klein, A.W. Andren, and Y.A. Talmi, "Selenium in Coal-Fired Steam Plant Emissions", Environ. Sci. and Tech., 9, 856 (1975).

D.H. Klein and P. Russell, "Heavy Metals: Fallout Around a Power Plant", Environ. Sci. and Tech., 7, 357 (1973).

Grants active 1977-78: Hope College, 1978, $1200 - Earth-Atmosphere Mercury Transfers.

MUNGALL, WILLIAM S. (b. 1945) Associate Professor. B.A., 1967, State University of New York at Buffalo, Ph.D., 1970, Northwestern. Organic Chemistry. Nucleotide chemistry, phosphorus-nitrogen compounds, amine synthesis.

W.S. Mungall, *L.J. Lemmen, *K.L. Lemmen, *J.K. Dethmers, and L.L.Norling,"Nucleoside 5'-Monophosphate Analogs: The Synthesis of 5'-Sulfamino-5'-deoxynucleosides", J. Med. Chem., 21, 704 (1978).

W.S. Mungall and *J.K. Kaiser, "Carbamate Analogs of Oligonucleotides", J. Org. Chem., 42, 703 (1977).

W.S. Mungall, *C.L. Martin and *G.C. Borgeson, "1,2-Dibromotetrafluoroethane as and Initiator for the Photopolymerization of Tetrafluoroethylene", Macromolecules, 8, 934 (1975).

W.S. Mungall, G.L. Greene, G.A. Heavner, and R.L. Letsinger, "Use of the Azido Group in the Synthesis of 5'-Terminal Aminothymidine Oligonucleotides", J. Org. Chem., 40, 1659 (1975).

W.S. Mungall, P. Mullar, G. Greene, and R.L. Letsinger, "Use of Phosphorus Oxychloride in the Synthesis of Nucleotides and Oligonucleotides", *Nucleic Acids Research*, *1*, 615 (1974).

Grants active 1977-78: ACS-PRF, 1977-1979, $11,000 - Selective Synthesis of Amines. Hope College, 1978, $1200 - Nucleotide Analogs.

SCHUBERT, JACK (b. 1917) Professor of Environmental Health Sciences. S.B., 1940, Ph.D., 1944, University of Chicago. *Environmental Chemistry*. Mixed ligand chelate formation; trap metal biochemistry and toxicology; radiation chemistry and biology; food irradiation; mutagenicity of metals and irriated foods; oxygen-carrying protein reactions.

Thirteen publications, 1973-78.

J. Schubert, E.J. Riley, and S.A. Tyler, "Combined Effects in Toxicology--A Rapid Systematic Testing Procedure: Cadmium-Mercury-Lead", *J. Toxicol. Environ. Health*, *4*, 763-778 (1978).

J. Schubert, "Toxicological Studies of Irradiated Food and Food Constituents", *Proceedings, International Symposium on Food Preservation by Irradiation*, Wageningen, The Netherlands (IAEA, Vienna), Vol. II., 3-29 (1978).

J.V. Kooij, H.B. Leveling, and J. Schubert, "Application of the Ames Mutagenicity Text to Food Processed by Physical Preservation Methods", *Proceedings, International Symposium on Food Preservation by Irradiation*, Wageningen, The Netherlands (IAEA, Vienna), Vol. II, 63-71 (1978).

H. Esterbauer, J. Schubert, E.B. Sanders, and C.C. Sweeley, "Yield of 2-deoxy-D-Gluconic, D-Gluconic and other Sugar Acids in Gamma-irradiated Aqueous Solutions of D-Glucose", *Z. Naturforsch.*, *32b*, 315 (1977).

H. Esterbauer, E.B. Sanders, and J. Schubert, "Isolation and Characterization of 2,3-Unsaturated Sugar: *trans*-2,3-Dideoxy-D-glyceropent-2-enose Produced by Thermal Dehydration of 2-Deoxy-D-erythro-pentose", *Carbonhyd. Res.*, *44*, 126 (1975).

Grants active 1977-78: DOE, Division of Biomedical and Environmental Research, 1977-1978, $88,500 - Plutonium Recorporation by Mixed Ligand Chelates.

SEYMOUR, MICHAEL D. (b. 1950) Assistant Professor. B.A., 1972, Saint Johns University, Ph.D., 1977, The University of Arizona. *Analytical Chemistry*. Application of solution and equilibrium chemistry to areas of environmental and clinical chemistry.

M.D. Seymour, J.W. Clayton, Jr. and Q. Fernando, "Determination of pK_a Values of Acid Components in Atmospheric Condensates by Linearization of Segmented Titration Curves", *Anal. Chem.*, *49*, 1429 (1977).

M.D. Seymour and Q. Fernando, "Effect of Ionic Strength on Equilibrium Constants", *J. Chem. Educ.*, *54*, 225 (1977).

WETTACK, F. SHELDON (b. 1938) Professor and Dean for the Divisions of Natural and Social Sciences. A.B., 1960, M.A., 1962, San Jose State College, Ph.D., 1967, University of Texas (Austin). *Physical Chemistry*. Photochemistry and photophysics; fluorescence spectroscopy and vibronic energy transfer of aromatic compounds.

F.S. Wettack, *D.R. Worsnop and P.H. Cheresen, "Energy Transfer from Single Vibronic Levels of Benzene ($^1B_{2u}$) and Fluorobenzene ($^1B_1$)", *J. Photochem.*, *5*, 159 (1976).

F.S. Wettack, *K.C. Janda, and *J.M. Koert, "Electronic Energy Transfer from Single Vibronic Levels of Benzene", *J. Photochem.*, *1*, 345 (1973).

WILLIAMS, DONALD H. (b. 1938) Professor. B.S., 1960, Muskingum College, Ph.D., 1964, Ohio State University. *Inorganic Chemistry*. Stereochemistry and reactivity of coordinated polydentate ligands.

D.H. Williams, *C.A. Denhart, *G.D. Spoelhof and *T.A. Swartz, "Stereospecific Chemistry of EDTA Analogs with Cobalt(III)", *Inorg. Chem.*, *14*, 2948 (1975).

D.H. Williams and J.T. Riley, "Preparations and Alcohol Oxidation Studies of Ferrate(VI) Ion, FeO_4^{2-}", *Inorg. Chim. Acta*, *8*, 777 (1974).

ILLINOIS BENEDICTINE COLLEGE
Lisle, IL 60532

Fall 1978 ug enrollment 1170
Degrees offered B.S.
Telephone (312) 969-6689

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 0.5 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 7 Grad. school 1 Industry 1 Professional schools 5 Other 0 .
4. Senior majors, average past five years: 14 .
5. Students involved in research, average past five years: Acad. yr. 15 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)
   NSF Fellowship - honorable mention, 1976 (E. Stanley Chase)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 18,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major istr. available for ug research (NMR, IR, etc.)

MS (Varian EM600)	AA (Varian AA-175 and M-1100)
UV-Vis (P-E 202 & Hitachi EPS-3T)	GC (P-E 900 & Varian A-90-P)
Spectrofluorometer (Turner M-430)	IR three (P-E 337's)
X-ray (Phillips)	

3. Library resources: Chem. abstracts? Yes Volume indices? No Collected indices? No Total journal subscriptions? 38 Computer literature search service? Yes Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 18 .
4. Computer facilities: Department: minicomputer, Division: Hewlett Package 2114 Campus: PDP 1134

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $3,000/yr chemicals and glassware; $2,000/yr for equipment
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   NSF - ISEP Grant, NMR Spectrometer $8,700
   IBC Chemical Research Grant $3,000
3. Faculty teaching loads: Contact hours 14-15 Load credit for research? none
4. Sabbatical or leave support for research: none

HAZDRA, JAMES J. (b. 1933) Professor of Chemistry and Director of Healthcare Education. B.S., 1955, Illinois Benedictine College. Ph.D., 1959, Purdue University. Organic-Analytical Chemistry. Organic and Inorganic Analysis. 20 publications, 1 patent, 1973-78.

J.J. Hazdra, *T. Bugno, Magnesium in Leukocyte Cells in Relation to Leukemogenesis, Advances in Comparative Leukemia Research, Elsivier/North Holland Biomedical Press, 3201, 1978.

J.J. Hazdra,*G.R. Coulomb, C. Harbert, E. R. Brown, and S.O. Schwartz, Determination of Trace Elements in Blood Serum of Leukemic Patients, Healthcare Research in Illinois, 1, 535(1976).

J.J. Hazdra, Chemical Internship at Illinois Benedictine College, J. Chem. Educ., 53, 150(1976).

J.J. Hazdra, Cooperative Chemical Education, Chemtech, 34, 465(1976).

E.R. Brown, L. Keith, J.J. Hazdra, and T. Arndt, Tumors in Fish Caught in Polluted Waters: Possible Explanation, Leukemogenesis, ed. Y. Ito and R.M. Dutcher, University of Tokyo Press, 47-57, 1975.

MCMILLAN, CLARA A. (b. 1919) Professor. Ph.D., 1946, University of Buenos Aires (Argentina). Inorganic-Nuclear Chemistry. Paramagnetism of Rare Earth Compounds.

J.A. McMillan, and C.A. McMillan, General Conditions for Representation of Axial and Dihedral Point Groups on the Basis of Spherical Harmonics of Any Value of l and m, Rev. Roum. Phys, 18 835(1973).

NEENAN, JOHN P. (b. 1943) Assistant Professor. B.S., 1969, Wayne State University, Ph.D., 1973, University of California. Organic Chemistry. Synthesis and biological evaluation of analogs of nucleic acid components.

Twelve publications, 2 patents, 1973-1978.

J.P. Horwitz, R.S. Misra, J. Rozhin, J.P. Neenan, A. Huo, V.C. Godefroi, K.D. Phillips, H-L. Chung, A. Butke, and S.C. Brooks, Studies on Bovine Adrenal Estrogen Sulfotransferase. IV. Synthesis and Assay of Analogs of Adenosine 3',5'-diphosphate as Inhibitors of Bovine Adrenal Estrogen Sulfotransferase, Biochim. et. Biophys. Acta, 480, 376(1977).

T-S. Lin, J.P. Neenan, Y-C. Cheng, W.H. Prusoff, and D. C. Ward, Synthesis and Antiviral Activity of 5- and 5'-Substituted Thymidine Analogs, J. Med. Chem., 19, 495(1976).

Y-C. Cheng, J.P. Neenan, B. Goz, D.C. Ward, and W.H. Prusoff, Selective Inhibition of Herpes Simplex Virus by 5'-Amino-2',5'-dideoxy-5'-iodouridine, J. Virol., 15, 1284(1975).

J.P. Neenan and W. Rohde, Inhibition of Thymidine Kinase from Walker 256 Carcinoma by Thymidine Analogs, J. Med. Chem., 16, 580(1973).

Grants active 1978-1979: U.S. Army Medical Research and Development Command, $21,105, Synthesis of Purine Nucleoside and Nucleotide Analogs as Antiparasitic Agents.

RAUSCH, DAVID J. (b. 1940) Professor and Chairman. B.S., 1962, St. Procopius College, Ph.D., 1966, Iowa State University. Organic Chemistry. Structure determination, organic reaction mechanism, photochemistry.

D.J. Rausch, J.J. Hazdra, and K.O. Munninger, Antithrombogenic Hemodialysis Membranes, U.S. Patent 4,051,040, September 27, 1977.

WESOLOWSKI, WAYNE E. (b. 1945) Associate Professor. B.S., 1967, St. Procopius College, Ph.D., 1971, University of Arizona. Physical-Inorganic Chemistry. Environmental Chemistry including iso-kinetic sampling of stationary sources. Computer simulation and industrial chemistry.

W.E. Wesolowski and J.J. Hazdra, Industrial Chemistry--Modular In-Depth Approach, J. Chem. Ed., 54, 7(1977).

W.E. Wesolowski, An Evaluation of Environmental Laboratories and Air Monitoring Systems, City of Chicago, Department of Environmental Control, October, 1975.

ITHACA COLLEGE

Ithaca, NY 14850

Fall 1978 ug enrollment 4,000

Degrees offered B.A. or B.S.

Telephone 607-274-3296

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2. Support staff: FTE's secretary 1.5 Stockrm .5 Technician 1
3. 1978 seniors & their placement: Total 15 Grad. school 8 Industry 0 Professional schools 3 Other 2 .
4. Senior majors, average past five years: 7.4 .
5. Students involved in research, average past five years: Acad. yr. ~18 Summer 16.4
6. National student honors, past five years (NSF fellowships, etc.)

Karen S. Root, NSF-Graduate Fellowship 1977-80-MIT, Chemistry. James T. Reinprecht Phi Kappa Phi Graduate Fellowship 1978, Yale Medical School

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 11,000 % used for teaching ~50 Research ~50
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   1. MS (AEI MS12)
   2. NMR (HA-60IL, T-60)
   3. UV-VIS (Cary 14, Varian 634, PE 124, Beckman DB)
   4. IR (P-E 337, 237, 137 (2))
   5. Stopped-flow (Durrum 110)
   6. Scint. Counter (Nuclear Chicago Unilux)
   7. GC (6 dual, 6 single column, 3 mini-grators)
   8. AA (P-E 103)
   9. Annular Still (P-E 151)
   10. Temperature-jump (Enfield Specialty DH-1)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 37 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 31 .

4. Computer facilities: Departmental: PDP/8-e. Campus: Univac Series 70/46.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $6,000 plus

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   NSF-URP, 3 year grant at $7,650 per summer (1977-79)

3. Faculty teaching loads: Contact hours ~12 Load credit for research? Yes

4. Sabbatical or leave support for research: Each faculty member has taken a sabbatical leave for a full year at 50% salary every seventh year. Outside support has been obtained by individuals for remaining salary.

ANDERSON, ROBERT (b. 1940) Associate Professor. B.S., 1962, College of St. Thomas; Ph.D., 1967, Univ. of California, Berkeley. *Physical and Analytical Chemistry*. Analytical applications of spectroscopy, computers in chemistry.

R. J. Anderson and P. R. Griffiths, "Determination of Rotational Temperatures of Diatomic Molecules from Absorption Spectra Measured at Moderate Resolution," *J. Quant. Spectrosc. Radiat. Transfer*, **17**, 393 (1977).

R. J. Anderson and P. R. Griffiths, "Errors in Absorbance Measurements in Infrared Fourier Transform Spectrometry Because of Limited Instrument Resolution," *Anal. Chem.*, **47**, 2339 (1975).

BERGMARK, WILLIAM (b. 1940) Professor. B.A., 1962, St. Olaf College; Ph.D., 1966, Massachusetts Institute of Technology. *Organic Chemistry*. Organic chemistry and photochemistry.

William R. Bergmark, "Photolysis of α-Chloro-*o*-methylacetophenones," *J. Chem. Soc., Chem. Commun.*, 61 (1978).

William R. Bergmark and Guilford Jones, II, "Photoisomerization of Linked Anthracenes. A Demanding Test of Molecular Geometry for Intermediates in Photodimerization," *Nouveau J. Chemie*, **1**, 271 (1977).

Guilford Jones, II, and William R. Bergmark, "Photon Energy Storage in Organic Materials: The Case of Linked Anthracenes," *Solar Energy*, **20**, 241 (1978).

M. M. Rauhut, B. G. Roberts, D. R. Maulding, W. R. Bergmark and R. Coleman, "Infrared Liquid Phase Chemiluminescence from Reactions of Bis(2,4,6-trichlorophenyl)Oxalate, Hydrogen Peroxide and Infrared Fluorescent Compounds," *J. Org. Chem.*, **40**, 330 (1975).

Grants: Research Corp., 1978-79, $8,400 - New aspects and applications of photoenolization.

DARROW, FRANK (b. 1940) Associate Professor. B.A., 1961, Williams College; Ph.D., 1965, University of Pennsylvania. *Physical Chemistry*. Problems in general and chemical education, history and philosophy of science, properties of electrolyte solutions and fused salt systems.

EBERHARD, ANATOL (b. 1938) Associate Professor. B.A., 1959, Univ. of California, Berkeley; M.A., 1960, Ph.D., 1964, Harvard University. *Organic and Biochemistry*. Bacterial bioluminescence, trace lipids.

Dotti Bentley,* Anatol Eberhard and Robert Solsky,* "Decyl Nitrite: An Aldehyde Analog in the Bacterial Bioluminescence Reaction," *Biochem. Biophys. Res. Commun.*, **56**, 865 (1974).

J. W. Hastings, A. Eberhard, T. O. Baldwin, M. Z. Nicoli, T. W. Cline and K. H. Nealson, "Bacterial Bioluminescence: Mechanistic Implications of Active Center Chemistry of Luciferase," in *Chemiluminescence and Bioluminescence*, ed. by M. J. Cormier, D. M. Hercules, and J. Lee, Plenum Publishing Corp., New York, N.Y., 1973, pp. 369-380.

HUGHES, LOU (b. 1928) Assistant Professor. B.S., 1951, Univ. of Minnesota, M.S., 1953, Ph.D., 1971, Cornell University. *Biophysical Chemistry*. Polymers, biophysical chemistry.

L. J. Hughes, J. Frank* and A. T. Wilson,* "Origin of Life: An Interdisciplinary Course in Chemical Evolution for Undergraduates," *J. Chem. Ed.*, **55**, 521 (1978).

KOCH, HEINZ (b. 1932) Professor and Chairman. B.S., 1954, M.S., 1955, Haverford College; Ph.D., 1960, Cornell University. Organic Chemistry. Physical organic, kinetic isotope effects, mechanisms of elimination reactions, nucleophilic reactions of alkenes.

H. F. Koch, D. B. Dahlberg, M. F. McEntee,* C. J. Klecha,* "Use of Kinetic Isotope Effects in Mechanism Studies. Anomalous Arrhenius Parameters in the Study of Elimination Reactions," J. Amer. Chem. Soc., 98, 1060 (1976).

H. F. Koch, D. B. Dahlberg, A. G. Toczko* and R. L. Solsky,* "Kinetic Arguments for the Existence of Hydrogen Bonded Carbanion Intermediates During Dehydrohalogenation Reactions of $C_6H_5CHClCF_2Y$," J. Amer. Chem. Soc., 95, 2029 (1973).

Grants: Research Corp. Cottrell College Science Grant, 1975-79, $26,000 - Mechanisms of elimination reactions. NATO (with R. D. Chambers, Durham, England), 1976-77, $4,000 - Structure and rearrangements of fluorinated carbanions.

KOCH, JUDITH (b. 1937) Assistant Professor. B.A., 1959, Ph.D., 1972, Cornell University. Organic Chemistry. Nuclear magnetic resonance.

PASTERNACK, ROBERT (b. 1936) Professor. B.A., 1957, Ph.D., 1962, Cornell University. Inorganic Chemistry. Bioinorganic chemistry, fast reaction kinetics, porphyrin chemistry, superoxide chemistry.

Nineteen publications, 1973-78.

Robert F. Pasternack, Bruce S. Gillies* and James R. Stahlbush,* "Kinetics and Thermodynamics of the Reactions of Two Iron(III) Porphyrins with Imidazole and 1-Methylimidazole in Dimethyl Sulfoxide," J. Amer. Chem. Soc., 100, 2613 (1978).

Robert F. Pasternack, Bruce S. Gillies* and Julia P. Stromsted,* "Substitution Reactions of a Water-Soluble Metalloporphyrin with Azide and 1,1,3,3-Tetramethyl-2-Thiourea," Bioinorg. Chem., 8, 33 (1978).

R. F. Pasternack and E. G. Spiro, "Study of the Kinetics of Reduction of an Iron(III) Porphyrin by Hexaammineruthenium(II). Estimate of the Self-Exchange Rate for a High-Spin Iron Porphyrin Complex," J. Amer. Chem. Soc., 100, 968 (1978).

D. F. Rohrbach, E. Deutsch, W. R. Heineman and R. F. Pasternack, "Thin Layer Spectroelectrochemical Study of Tetrakis-(4-N-methylpyridyl)porphinatocobalt-(III)," Inorg. Chem., 16, 2650 (1977).

Robert F. Pasternack and James R. Stahlbush,* "Kinetics of Binding of Imidazole to $\alpha,\beta,\gamma,\delta$-Tetraphenylporphinatoiron(III) in Dimethylsulfoxide," J. Chem. Soc., Chem. Commun., 106 (1977).

Grants: NIH, 1975-78, $77,000 - Fast reactions in solution. Research Corporation, Cottrell College Science Grant, 1978-81, $13,500 - Reactions of Superoxide Ion with Model Compounds. NATO, 1978-79, $4,000.

VOGEL, GLENN (b. 1943) Associate Professor. B.S., 1965, Pennsylvania State University, M.S., 1967, Ph.D., 1970, University of Illinois. Inorganic Chemistry. Lewis acid-base interactions, physical inorganic chemistry.

Seven publications, 1973-78.

D. G. Brown and G. C. Vogel, "An Efficient Halogen Atom Abstraction Reaction Facilitated by a Redox Active Ligand," Inorg. Chem., 17, 1367 (1978).

D. G. Brown, L. Beckmann, C. H. Ashby, G. C. Vogel, and J. T. Reinprecht,* "Oxygen Dependent Ring Cleavage in a Copper Coordinated Catechol," *Tetrahedron Lett.*, **16**, 1363 (1977).

Glenn C. Vogel and James R. Stahlbush,* "Thermodynamic Study of the Adduct Formation of Zinc Tetraphenylporphine with Several Neutral Donors in Cyclohexane," *Inorg. Chem.*, **16**, 950 (1977).

D. G. Brown, J. T. Reinprecht,* and G. C. Vogel, "Synthesis and Characterization of Copper(II) Catecholato Complexes," *Inorg. Nucl. Chem. Lett.*, **12**, 399 (1976).

B. A. Beckmann,* A. Buchman, R. F. Pasternack, J. T. Reinprecht,* and G. C. Vogel, "An Advanced Laboratory Experiment in Bioinorganic Chemistry," *J. Chem. Ed.*, **53**, 387 (1976).

WILCOX, MARY (b. 1930) Assistant Professor. B.A., 1952, Mount Holyoke College, M.S., 1954, University of Colorado, Ph.D., 1960, Cornell University. *Organic Chemistry*. Mechanisms of solvolysis reactions.

JUNIATA COLLEGE

Huntingdon, Pennsylvania 16652

Fall 1978 ug enrollment 1,117

Degrees offered B.A., B.S.

Telephone 814-643-4310

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 1/2 Stockrm 1 Technician 1/3
3. 1978 seniors & their placement: Total 13 Grad. school 6 Industry 1 Professional schools 5 Other 1 .
4. Senior majors, average past five years: 12 .
5. Students involved in research, average past five years: Acad. yr. 5 Summer 8
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,400 % used for teaching 70 Research 30
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR 60 MHz (Varian T60) and
100 MHz (Varian HA 100)
IR (P-E 221G)
UV-Vis (Beckman 25)
MS (DuPont 21-490)
Liq. Scint. Counter (Picker 220)
Ultracentrifuge (Beckman L3-50)
DSC (DuPont 900)
GC (Packard)
AA (Heath 703)
X-Ray (GE XRD6)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 31 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 26 .
4. Computer facilities: Department: minicomputers--2 Data General NOVAs, floppy disks, videc graphic and hard copy plotters, terminal to campus RSTS/E time-sharing system. Campus: PDP 11/34 RSTS/E time sharing.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Chemicals $1,000	Equipment $0	Student Stipend $1,600

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

N/A

3. Faculty teaching loads: Contact hours 14 Load credit for research? Occasionally
4. Sabbatical or leave support for research:

Faculty can apply for sabbatical leave at 50% salary full year, 100% salary summer and one-third academic year.

FACULTY PROFILE

FISHER, TOM LYONS (b.1942), Assistant Professor. B.S., 1964, Old Dominion University, Ph.D., 1970, Iowa State University. Research Associate, 1970-72, Virginia Polytechnic Institute & State University. Biochemistry. Bio-organic chemistry.

B. M. Anderson and T. L. Fisher, Preparation of 3-aminopyridine adenine dinucleotide, Methods in Enzymology, Vitamins and Coenzymes, ed. D.B. McCormick, 1979.

B. M. Anderson, S. V. Vercellotti, and T. L. Fisher, Maleimide inactivation of lactate dehydrogenase isozymes, Biochim. Biophys. Acta, 350, 135-140(1974).

T. L. Fisher, S. V. Vercellotti, and B. M. Anderson, Interactions of 3-aminopyridine adenine dinucleotide with dehydrogenases, J. Biol. Chem., 248, 4293-4299 (1973).

Research grant, 1978-79, Research Corporation, $5,300, Interaction of 3-azido-1-methylpyridinium chloride with NAD-dependent enzymes.

MITCHELL, DONALD J. (b.1938), Associate Professor and Chairman. B.S., 1960, Westminster College (PA), Ph.D., 1964 Vanderbilt University. Postdoctoral research, 1964-67, Naval Research Laboratory, NSF Fellow and Visiting Lecturer, 1976-77, The University of Sheffield, Sheffield, England. Physical Chemistry. Structure of materials by X-ray diffraction and electron microscopy, and the gasification of coal.

Paul D. Schettler, Jr., Dale L. Wampler, Philip J. Sipling, and Donald J. Mitchell, The relationship of thermodynamic and kinetic parameters to well production in Devonian shale, Proceedings of the First Annual Gas Shales Symposium, Morgantown, WV, Oct. 1977, p. 450, Tech. Info. Center, USDOE, Publication #MERC/SP-77/5.

Paul Schettler, Dale Wampler, Donald Mitchell, William Russey, Degasification of Devonian shales, Proceedings of Seventh Appalachian Petroleum Geology Symposium. Devonian Shale Production and Potential, Morgantown, WV, Mar. 1976, p. 239, USDOE, Publication # MERC/SP-76/2.

REED, RUTH E. (b.1946), Assistant Professor. B.A., 1968, Winthrop College, Ph.D., 1974, Virginia Polytechnic Institute & State University. NIH Fellow, 1974-76, The Johns Hopkins University. Biochemistry. Metabolic control and enzyme regulation in higher plants.

D. T. Tarlow, P. W. Watkins, R. E. Reed, R. S. Miller, E. E. Zwergel, and M. D. Lane, Lipogenesis and the synthesis and secretion of very low density lipoprotein by avian liver cell in nonproliferating monolayer culture: hormonal effects, J. Cell Biol., 73, 332-353(1977).

R. E. Reed and J. L. Hess, Partial purification and characterization of aspartate aminotransferases from seedling oat leaves, J. Biol. Chem., 250, 4456-4461(1975).

J. L. Hess and R. E. Reed, Considerations of oxalacetic acid keto-enol equilibria in various solvents, Arch. Biochem. Biophys., 153, 226-232(1972).

RUSSEY, WILLIAM E. (b.1939), Professor. B.A., 1961, Kalamazoo College, M.A., 1964, Harvard University, Ph.D., 1967, Harvard University. NSF Faculty Fellow in Science, 1975-76, Max Planck Institute for Coal Research, Mülheim/Ruhr, Germany. Organic Chemistry. Synthetic organic chemistry, biochemistry, coal chemistry.

Paul Schettler, Dale Wampler, Donald Mitchell, William Russey, Degasification of Devonian shales, Proceedings of Seventh Appalachian Petroleum Geology Symposium. Devonian Shale Production and Potential, Morgantown, WV, Mar. 1976, p. 239, USDOE, Publication # MERC/SP-76/2.

SCHETTLER, PAUL D., JR. (b.1937) Professor. B.S., 1960, University of Utah, Ph.D., 1964, Yale University. Postdoctoral research, 1964-66, Yale University and University of Utah; teaching intern, 1966-67, Antioch College; sabbatical research, 1974-75, Laboratoire de Chimie Physique, Lille, France. Physical Chemistry. Kinetics and thermodynamics of sorption, theory of gas chromatography, gas well production; solvated electrons.

Eight publications, 1973-78.

Paul D. Schettler, Jr., The implication of specific degasibility for models of gas production from shale, Proceedings of the Second Eastern Gas Shales Symposium, Morgantown, WV, Oct. 1978.

Paul D. Schettler, Jr., The concept of specific degasibility and its application to gas bearing tight formations as represented by the Devonian shales of Appalachia, Proceedings of the Fourth Annual Symposium on Enhanced Oil and Gas Recovery and Drilling Methods, Vol. 2, p. G8/1, Aug. 1978.

Pierre Damay and Paul D. Schettler, Jr., Fluctuations in metal ammonia solutions, J. Phys. Chem., 79, 2930(1975).

Paul D. Schettler, Jr., and Gerard Lepoutre, Interactions between solvated electrons. I. Electron-electron, electron-solvent, solvent-solvent interactions in ammonia. Valence bond approximation, J. Phys. Chem., 79, 2823(1975).

Paul D. Schettler, Jr., A computer program in statistical thermodynamics, J. Chem. Ed., 51, 250(1974).

Research grant, 1978-79, U. S. Department of Energy, $74,999.33, Study of hydrocarbon-shale interaction.

WAMPLER, DALE L. (b.1936), Professor. A.B., 1957, Bridgewater College, Ph.D., 1962, University of Wisconsin. Senior Visiting Fellow, 1969-70, Cambridge University. Inorganic Chemistry. The application of minicomputers in chemistry, the thermodynamics and kinetics of desorption of hydrocarbons from Devonian shales, structural chemistry by single crystal X-ray diffraction techniques.

Paul D. Schettler, Jr., Dale L. Wampler, Philip J. Sipling, and Donald J. Mitchell, The relationship of thermodynamic and kinetic parameters to well production in Devonian shale, Proceedings of the First Annual Gas Shales Symposium, Morgantown, WV, Oct. 1977, p. 450, Tech. Info. Center, USDOE, Publication #MERC/SP-77/5.

Paul Schettler, Dale Wampler, Donald Mitchell, William Russey, Degasification of Devonian shales, Proceedings of Seventh Appalachian Petroleum Geology Symposium. Devonian Shale Production and Potential, Morgantown, WV, Mar. 1976, p. 239, USDOE, Publication # MERC/SP-76/2.

KING'S COLLEGE

Wilkes-Barre, PA 18711

Fall 1978 ug enrollment 1610

Degrees offered A.B., B.S.

Telephone (717) 824-9931

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 5 Grad. school 3 Industry 1 Professional schools 1 Other 0 .
4. Senior majors, average past five years: 7 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

   1 NSF Honorable Mention

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 51,500 % used for teaching 50 Research 50
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

   NMR (P-E R-12)
   EPR (Varian E-4)
   AA (P-E 305-A)
   X-Ray (Picker 3488)
   ThermoAnalyzer: DSC-DTA (P-E 1B)
   TGA (P-E 1)
   IR (Beckman IR20-A)
   MS (Varian EM600)
   GC (F&M 700)
   Laser Raman (Beckman with Coherent Rad. Model 54 argon Laser)
   Spectrofluorimeter (Turner 430)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 50 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 50 .
4. Computer facilities: Department: CRT Terminal
   Campus: IBM 370 Computer

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   $3000/year (Chemicals and glassware) $4000/year for equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   NSF CAUSE Grant $150,700, Computer applications in Undergraduate Science Education (1978-1981)

3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 7th year.

BORKOWSKI, RAYMOND P. (b. 1934) Professor. B.S., 1955 King's College; Ph.D., 1961 Catholic University of America. Physical Chemistry. Use of ESR to quantitatively monitor the concentration of paramagnetic species in aqueous solutions and the effect of various environmental factors on the luminescence of rare earth complexes dissolved in liquid media.

KAZLAUSKAS, CLEMENT L. (b. 1921) Department Chairman, Associate Professor. B.S., 1950 University of Scranton; M.S., 1952 Boston College. Organic Chemistry. Synthesis and structure determination.

MITRA, GRIHAPATI (b. 1927) Professor. B.S., 1947 University of Calcutta; M.Sc., 1949 University of Calcutta; D.Sc., 1954 University of Calcutta.

Thirty eight papers were published prior to 1973.

Fourteen publications 1973-1978.

*R. Ritchie and G. Mitra, "Preparation and Properties of Potassium Pentefluorodioxo-Tungstate (V_1 $K_3WO_2F_5$ and Potassium Octofluorpenteoxo-Ditungstate (V_1) $K_6W_2O_5F_8$" Journal of Fluorine Chemistry, 10, 405 (1977).

*D. Foose and G. Mitra, "On the Structure of $CsHScO_4$", Journal of Inorganic and Nuclear Chemistry, 39, 553 (1977).

*P. Slota, *W. Sunday, *R. Rakshapal and G. Mitra, "On the Chemistry of the Salts of Monofluorotrioxovanadate(v), Part I Preparation and Properties of $BaVO_3F$", Journal of Fluorine Chemistry, 6, 181 (1975).

*S. Okrasinski and G. Mitra, "Structural Similarity Between Tetramethyl Ammonium Periodate $N(CH_3)_4IO_4$ and Tetramethyl Ammonium Perchorate $N(CH_3)_4ClO_4$", Journal of Inorganic and Nuclear Chemistry, 37, 1315 (1975).

*S. Okrasinski and G. Mitra, "Preparation and Structure of Tetramethyl Ammonium Perrhenate(VII) $N(CH_3)_4ReO_4$", Journal of Inorganic and Nuclear Chemistry, 36, 1908 (1974).

SAULS, FREDERICK C. (b. 1947) Assistant Professor. B.S., 1969 Franklin and Marshall College; M.S., 1974 University of Pittsburgh; Ph.D., 1974 University of Pittsburgh. Analytical Chemistry. Application of newer methods of analysis to problems of forensic interest; kinetics of transition-metal complexation reactions; application of computers to chemical education.

M. Wartell, F. Sauls, Introduction to Criminalistics, J. Chemical Education, 53, 1976.

SMITH, FRANCIS X. (b. 1945) Assistant Professor. B.S., 1967 Lowell Technological Institute; M.S., 1969 Lowell Technological Institute; Ph.D., 1972 Tufts University. Organic synthesis, chemistry of heterocyclic compounds, bio-organic chemistry.

Eight publications 1973-1978.

*A. Scoville and F. Smith, "A Malonic Ester Type Synthesis with 4-Chloroquinoline Utilizing Highly Acidic Enols", Journal of Heterocyclic Chemistry, (1977).

G. Evans, F. Smith, "Nucleophilic Substitution on the Pyridine Ring with Enolate Anions", Journal of Heterocyclic Chemistry, 13, 1025 (1976).

R. Sunberg, F. Smith. "Photocyclization of 2-(N-Chloroacetylpiperidylalkyl) indoles. A Novel Case of Stereoisomerism Dependent on Sterically Restrained Conformers", Journal of Organic Chemistry, 40, 2613 (1975).

R. Sunberg, F. Smith and L-S. Lin, "Synthesis and Cyclization of 2-(3-Indolymethyl) -3-Hydroxy-4-piperidineacetic Acid Derivaties", Journal of Organic Chemistry, 40, 1433 (1975).

R. Sunberg, L-S. Lin, F. Smith, "Photochemical Deconjugation as a Synthetic Route to 1,2,3,6-Tetrahydropyridine -4-acetic Acid Esters from Δ^4 - Piperidine -4- acetic Acid Esters", Journal of Organic Chemistry, 38, 2558 (1973).

Grant Active: 1976-1978- Rotaxanes with fluorescent end groups, Research Corporation Cottrell College Science Grant $2,000.

KNOX COLLEGE
Galesburg, Ill. 61401

Fall 1978 ug enrollment 1045
Degrees offered B. A.
Telephone (309) 343-0112

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4½. 2. Support staff: FTE's secretary ½ Stockrm 1 Technician ½
3. 1978 seniors & their placement: Total 28 Grad. school 7 Industry 4 Professional schools 6 Other 11.
4. Senior majors, average past five years: 24.
5. Students involved in research, average past five years: Acad. yr. 6 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 30,000 % used for teaching 75 Research 25
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR 60MH$_z$ Varian T-60
IR Perkin-Elmer M727
IR Beckman IR-8
GC Variety of five instruments
UV-Vis Heath M-703
ESR Varian V4500
UV-Vis Beckman DB

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 18 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 12.
4. Computer facilities: Campus; PDP-11. Dept.; Wang M600 (programmable)

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   Approx. $1000/yr.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   du Pont College Science Grant $6500
   Johnson Wax Fund $2000

3. Faculty teaching loads: Contact hours 12 Load credit for research? Nil
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at half salary for full year or for shorter periods with more than half salary. Frequency has averaged one faculty member on sabbatical leave every fourth year for the last 20 years.

FACULTY PROFILE

HARRIS, LELAND (b.1923) Professor, B.S., 1950, University of Michigan, Ph.D., 1955, State University of Iowa. *Organic Chemistry*. Diels-Alder syntheses with cinnamic acids and photosynthesis.

HIEBERT, ALLEN G. (b.1941) Associate Professor. B.A., 1963, Tabor College, Ph.D., 1967, University of Illinois. *Analytical Chemistry*. Interfacing of microcomputers with instrumentation. Dreyfuss Foundation Grant, $10,000/yr.

KOOSER, ROBERT G. (b.1941) Associate Professor. B.A., 1963, St. Olaf College, Ph.D., 1968, Cornell University. *Physical Chemistry*. Electron spin resonance.

R. B. Clarkson and R. G. Kooser, Molecular Motion on Surfaces as Investigated by Saturation Transfer EPR, Surface Science, *74* 325 (1978).

R. G. Kooser, Electron Spin Relaxation Mechanisms and Solvent Coordination in Bis (dithiooxalato) nitrosyliron (I) Solutions, J. Phys. Chem., *80*, 1601 (1976).

NEUMILLER, HARRY J (b.1929) Associate Professor and Registrar. B.A., 1951, Knox College, Ph.D., 1956, University of Illinois. *Organic Chemistry*. Quinoneimides.

SUTTON, RUSSELL (b.1929) Professor and Chairman. B.S., 1951, University of Missouri, Ph.D., 1955, State University of Iowa. *Organic Chemistry*. Reactions of Chalcones and 1-Alkyl-1-methylolcycloalkanes.

LAFAYETTE COLLEGE

Easton, PA 18042

Fall 1978 ug enrollment 2072

Degrees offered A.B., B.S.

Telephone (215)253-6281

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9.5. 2. Support staff: FTE's secretary .5 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 18 Grad. school 4 Industry 7
   Professional schools 5 Other 2.
4. Senior majors, average past five years: 19.
5. Students involved in research, average past five years: Acad. yr. 7 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

   One N.S.F. Fellowship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 22,000 % used for teaching 50% Research 11%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR-60MHz (JEOL MH-60)
   IR (PE-299, Beckman IR-10, Unicam SP-1000)
   GC (F&M 700, Aerograph 204, 2 ea. Carle 8500)
   Polarograph (P.A.R. 174A)
   UV-VIS (Beckman DK-2A)
   Electroanalyzer (Fisher 40)
   TLC Densitometer (Kontes K-495000)
   DTA and X-Ray diffraction available in other departments
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes
   Total journal subscriptions? 51 Computer literature search service? No
   Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 15.
4. Computer facilities: Campus: Hewlett-Packard 3000 time sharing.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Campus: $15,000/yr; Departmental Budget: ca. $1500/yr plus use of regular departmental teaching equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   DuPont College Science Grant $6500
   National Starch & Chemical Co. 500
3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at full salary for a semester or 50% of salary for a full year. Eligibility, once every seven years. Junior leaves for junior faculty are also available.

FACULTY PROFILE

COOK, ROBERT C. (b. 1947) Assistant Professor. B.S., 1969 Lafayette College, M.Ph., 1971, Ph.D., 1973, Yale University. Physical Chemistry. Theory of simple solid and liquid systems, defects in solids; statistical mechanics of model polymer systems, polymer conformational analysis; polymer synthesis.

R. Cook, Poly(2-Ethyl-2-n-Butyl Trimethylene Sulfone), J. Poly. Sci. A-1, 16, 3001 (1978).

R. Cook and *A. Shuldiner, The Free Energy of Vacancy Pairs, J. Chem. Phys., 69, 4114 (1978).

R. Cook and *M. Moon, Configurational Properties of Flexible Polymer Chains, Macromolecules, 11, 1054 (1978).

R. Cook and *D. Negri, The Free Energy of a Vacancy, J. Chem. Phys., 66, 3917 (1977).

W. G. Hoover, R. Cook, and W. T. Ashurst, Statistical Mechanics of Fracture, in Proceedings of the Fifth Atlas Computer Symposium, Queens College, Oxford, 1975.

HAENDLER, BLANCA L. (b. 1948) Assistant Professor. B.A., 1969, Goucher College, Ph.D., 1974, The Johns Hopkins University. Physical Chemistry. Heterogeneous catalysis: mechanistic studies of gas-solid reactions; thermal decompositions of complex inorganic compounds.

Lynda K. Beck, Helmut M. Haendler, and Blanca H. Kugler, The Thermal Decomposition of Ammonium Hexafluorogallate and Ammonium Hexafluoroindate. New Crystalline Forms of Gallium Fluoride and Indium Fluoride, J. Solid State Chem., 8, 312 (1973).

B. L. Kugler and R. J. Kokes, Intermediates in the Oxidation of Propylene over Zinc Oxide, J. Catalysis, 32, 170 (1974).

Blanca L. Kugler and John W. Gryder, Investigation of the Mechanism of Propylene Oxidation on Zinc Oxide, J. Catalysis, 44, 126 (1976).

JAMES, LAYLIN K. (b. 1927) Professor. B.S., 1952, University of Michigan, Ph.D., 1958, University of Illinois. Physical Chemistry. Surface chemistry, physical biochemistry.

L. K. James and P. Sherman, Creep Compliance Studies of Egg Yolk Lipoprotein Interfacial Films, Biorheology, 13, 79 (1976).

MILLER, THOMAS G. (b. 1924) Professor and Department Head. A.B., 1948, Miami University, M.S., 1949, Ph.D., 1951, University of Illinois. Organic Chemistry. Clathrate compounds, reactions of 2,5-cyclohexadien-1-one derivatives.

NEWLAND, ROBERT J. (b. 1946) Assistant Professor. B.A., 1968, Kalamazoo College, Ph.D., 1974, Wayne State University. Organic Chemistry. New synthetic methods, carbanion chemistry, medicinal chemistry. ACS-PRF Type G Grant, $9000, 1976-1979.

PEACE, G. EARL (b. 1945) Associate Professor. B.S., 1966, Lafayette College, M.S., 1968, Ph.D., 1971, University of Illinois, Urbana-Champaign. Analytical Chemistry. Environmental chemistry; equilibrium and kinetic studies of acid rain.

G. E. Peace, Edward Hart, Ph.D.--The Man Behind the Journal, Anal. Chem., 50, 1194a (1978).

*S. J. Ali, Jr., M. J. Bradford, and G. E. Peace, Mercury in North Atlantic Lobster of the New York Bight, Proc. of the Penna. Acad. Sci., 51, 26 (1977).

SHERMA, JOSEPH A. (b. 1934) Professor. B.S., 1955, Upsala College, Ph.D., 1959, Rutgers University. Analytical Chemistry. Liquid chromatographic analysis of inorganic and organic compounds and pesticide residues.

Eighty-one publications, 1973-1978, including five books.

SHERMA, JOSEPH A., cont'd

J. Sherma and *M. Latta, Reversed Phase TLC of Chloroplast Pigments on Chemically Bonded TLC Plates, J. Chromatogr., 154, 73 (1978).

J. Sherma, *A. J. Kovalchick, and *R. Mack, Quantitative Determination of Carbanyl in Apples, Lettuce, and Water by Densitometry of Thin Layer Chromatograms, J. Assoc. Off. Anal. Chem., 61, 616 (1978).

SIEMIENCOW, GEORGE (b. 1915) Assistant Professor. Degree of Chemist (M.S. equivalent), University of Kiev, 1937. Physical Chemistry.

History of Chemistry and Chemical Education, particularly in the Soviet Union.

WALTERS, LEE R. (b. 1928) Assistant Professor. B.S., 1954, Bucknell University, Ph.D., 1958, University of Kansas. Organic Chemistry. Reactions of Reissert compounds.

L. R. Walters, *R. C. Cook, and *E. A. McFadden, Reaction of Hydroxylamine with Reissert Compounds, J. Chemical & Engineering Data, 16, 115 (1972).

LAWRENCE UNIVERSITY
Appleton, WI 54912

Fall 1978 ug enrollment 1155
Degrees offered B.A.
Telephone (414) 739-3681

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 1/3 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 22 Grad. school 6 Industry 3 Professional schools 9 Other 4 .
4. Senior majors, average past five years: 13 .
5. Students involved in research, average past five years: Acad. yr. 9-10 Summer 3-4
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,000 % used for teaching 85% Research 15%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - Perkin-Elmer R12-B
IR - Perkin-Elmer 137 & 337
UV/visible - Cary 14; Beckman DU w/Digital Absorbance Unit
Mass Spectroscopy - Varian EM-600
Gas Chromatographs (3)
Liquid Scintillation Counter (Beckman LS-230)
High-Speed Refrigerated Centrifuge, Lourdes Betafuge

3. Library resources: Chem. abstracts? No* Volume indices? No* Collected indices? No* Total journal subscriptions? 24* Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 12 .

*Lawrence students & faculty have access to C.A. & the extensive holdings of the Inst. of Paper Chemistry on its adjacent campus.

4. Computer facilities: 1. DEC PDP 11/45 time sharing system, 18 terminals. 2. DEC PDP 11/20 laboratory computer. 3. Access to IBM 360/44.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $2180, including a portion of the departmental budget allocated to research & several internal grants to individual faculty members.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: NSF-ISEP, $5600-mass spectrometer; Johnson's Wax Fund, Inc., $2000; NSF-CAUSE, $228,000, shared grant between several departments for computer instrumentation and facilities.
3. Faculty teaching loads: Contact hours 10 Load credit for research? No

4. Sabbatical or leave support for research: Seventy percent of salary for full year; eligible every seven years. Sabbaticals can also be spread over three years taking one term of three each year with the 70% base figure proportioned accordingly.

FACULTY PROFILE

EVANS, JAMES S. (b. 1941) Associate Professor. B.S., 1962, Bates College, M.A., 1964, Ph.D., 1966, Princeton University. *Physical and Inorganic Chemistry*. Coordination compounds, sulfate complexes; computer-controlled instrumentation; chemistry of noble metals; nuclear chemistry.

R. M. Rosenberg and J. S. Evans, *Solutions Manual* to accompany *Principles* of Physical Chemistry, by R. M. Rosenberg, Oxford University Press, 1977.

*C. Reiser and J. S. Evans, Digital Interface for Remote Control of a Cary 14 Spectrophotometer, *Rev. Sci. Instrum.*, *47*, 1216 (1976).

*C. E. Baldwin and J. S. Evans, Determination of the Ionization Constant of Sparingly Soluble Weak Acids; An Experiment for Analytical-Organic Courses. *J. Chem. Educ.*, *51*, 205 (1974).

R. C. Williams and J. S. Evans, *BASIC Programs From Chemistry* (Part II), in *Introduction to Computer Programming for Chemists - BASIC Version*, by C. L. Wilkins, C. E. Klopfenstein, T. L. Isenhour, and P. C. Jurs, Allyn and Bacon (1974).

*S. L. Holmgren and J. S. Evans, Accurate Contours for sp^{α} Hybrid Orbitals: Some Computer-assisted Exercises, *J. Chem. Educ.*, *51*, 189 (1974).

JOEL, PETERANNE B. (b. 1935) Assistant Professor. B.A., 1956, Keuka College, M.A., 1957, Ph.D., 1961, Radcliffe College. *Biochemistry*. Biochemistry of brain lipids.

C. D. Joel, *R. S. Jerde, P. B. Joel, *G. Peterson, *J. R. Stroemer, and *R. O. Haight, Vertebrate and Invertebrate Central Nervous System Fatty Acid Patterns, *Trans. Am. Soc. Neurochem.*, *7*, No. 1, 128 (1976).

*R. S. Jerde, P. B. Joel, * J. S. Stroemer, *R. O. Haight, and C. D. Joel, A Comparative Study of Nervous Tissue Fatty Acid Patterns of Various Animal Species with Particular Reference to Docosahexaenoic Acid, *Biochem. Soc. Trans.*, *3*, 727 (1975).

C. D. Joel, *C. A. Ellis, *J. K. Lace, P. B. Joel, *M. R. Swanson, and *J. R. Stroemer, Stability of the Brain Fatty Acid Pattern in Adult Rats during Extreme Starvation, *J. Neurochem.*, *23*, 23 (1974).

JOEL, CLIFFE D. (b. 1932) Associate Professor. B.A., 1953, Pomona College, M. A., 1955, Ph.D., 1959, Harvard University. *Biochemistry*. Chemistry and metabolism of lipids of the nervous system, unsaturated fatty acids; neurochemistry.

Six publications, 1973-78.

C. D. Joel, Fat, World Book Encyclopedia, Field Enterprises Educational Corporation, Chicago, 1978.

C. D. Joel, *J. Hansen, *R. Jerde, *J. Marini, and *B. Shefrin, Central Nervous System Fatty Acid Patterns in Water-Based Invertebrates, *Trans. Am. Soc. Neurochem.*, *9*, No. 1, 112 (1978).

C. D. Joel, *R. S. Jerde, P. B. Joel, *G. Peterson, *J. R. Stroemer, and *R. O. Haight, Vertebrate and Invertebrate Nervous System Fatty Acid Patterns, *Trans. Am. Soc. Neurochem.*, *7*, No. 1, 128 (1976).

*R. S. Jerde, P. B. Joel, *J. R. Stroemer, *R. O. Haight, and C. D. Joel, A Comparative Study of Nervous Tissue Fatty Acid Patterns of Various Animal Species with Particular Reference to Docosahexaenoic Acid, *Biochem. Soc. Trans.* *3*, 727 (1975).

C. D. Joel, *C. A. Ellis, *J. K. Lace, P. B. Joel, *M. R. Swanson, and *J. R. Stroemer, Stability of the Brain Fatty Acid Pattern in Adult Rats during Extreme Starvation, *J. Neurochem.*, *23*, 23 (1974).

Grant active 1978-80: Research Corporation, $9,400, Possible Chemical Mechanisms of Damage in Retinal Rod Outer Segments.

LOKENSGARD, JERROLD P. (b. 1940) Associate Professor and Department Chairman. B.A., 1962, Luther College, M.A., 1964, Ph.D., 1967, University of Wisconsin. *Organic Chemistry*. Synthesis of natural products, insect defensive compounds; new synthetic reactions; chemistry of diazo ketones; strain effects on organic reactions.

J. P. Lokensgard, *P. B. Comita, and *K. M. Rowland, Jr., The Preparation of 2-Oxazolines from Lactones, *J. Org. Chem.*, *42*, 1467 (1977).

P. Yates, F. X. Garneau, and J. P. Lokensgard, Prepartion and Spectra of Mercuribis (α-Diazo Ketones), *Tetrahedron*, 31, 1979 (1975).

P. Yates and J. P. Lokensgard, Diels-Alder Adducts of 6-Heterosubstituted Fulvenes, *Synth. Comm.*, *5*, 37 (1975).

J. P. Lokensgard, *J. O'Dea, and E. A. Hill, Decomposition of a β,γ-Unsaturated Diazo Ketone: Evidence for the Intermediacy of a Bicyclopentanone. *J. Org. Chem.*, *39*, 3355 (1974).

Grant active 1977-78: Research Corporation, $5,000, The Total Synthesis of Pederine.

ROSENBERG, ROBERT M. (b. 1926) Professor. B.S., 1947, Trinity College, Ph.D., 1951, Northwestern University. *Physical Chemistry*. Physical Chemistry of proteins, conformational changes on denaturation, subunit interactions in enzymes, enzyme kinetics.

R. M. Rosenberg, *The Principles of Physical Chemistry*, Oxford U. Press, New York, 1977.

R. M. Rosenberg and J. S. Evans, Stolutions Manual to Accompany Principles of Physical Chemistry, Oxford U. Press, 1977.

Grant Active 1977-78: Research Corporation, $4,500, Subunit Interaction in Glutamate Decarboxylase.

WEST, ALLEN C. (b. 1930) Associate Professor. A.B., 1957, Princeton University, Ph.D., 1961, Cornell University. *Analytical Chemistry*. Fundamental aspects of flame spectroscopy; chemistry of manganese.

A. C. West, R. N. Knisely, V. A. Fassel, Interelement Effects in the Flame: Spectroscopic Determination of Aluminum, Molybdenum, and Vanadium in a Nitrous Oxide-Acetylene Flame Formed on a Circular Slot Burner, *Anal. Chem.*, *45*, 815 (1973).

A. C. West, V. A. Fassel, R. N. Kniseley, Lateral Diffusion Interferences in Flame Atomic Absorption and Emission Spectrometry, *Anal. Chem.*, *45*, 1586 (1973).

A. C. West, R. N. Kniseley, V. A. Fassel, The Calcium-Phosphate Solute Volatilization Interference in Flame Spectroscopy: A Lateral Diffusion Interference Effect, *Anal. Chem.*, *45*, 2420 (1973).

LEBANON VALLEY COLLEGE

Annville, PA 17003

Fall 1978 ug enrollment 938

Degrees offered B.S.

Telephone (717) 867-4411

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 1 Stockrm ½ Technician 0
3. 1978 seniors & their placement: Total 11 Grad. school 4 Industry 2 Professional schools 0 Other 5 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 15 Summer 8
6. National student honors, past five years (NSF fellowships, etc.)
   None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 23,500 % used for teaching 90% Research 10%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   Beckman ACTA M-IV Spec
   Bausch & Lomb 505 Spec
   Coleman UV-VIS 124 Spec
   Hitachi-Perkin Elmer R-24 NMR
   Precision calorimeter
   Perkin-Elmer 900 Chromatograph
   Radiochemistry facilities
   PE Fluoresence Spec MFP-4
   PE 457, 700 A IR Specs
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 32 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 5 .
4. Computer facilities: Dept.: Hewlett-Packard 2100S, 16K core, hi-speed paper tape punch, hi-speed paper tape reader, terminal, data acquisition system, programmable clock. Campus: PDP 11/40 computer system.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Chemicals and major equipment, student support
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None
3. Faculty teaching loads: Contact hours 15 Load credit for research? No
4. Sabbatical or leave support for research:
   Faculty can apply for sabbatical leave at half salary full year, full salary half year.

FACULTY PROFILE

BAILEY, DAVID N. (b. 1941) Associate Professor. B.S., 1963, Juniata College, Ph.D., 1968, Massachusetts Institute of Technology. Analytical Chemistry. π-charge transfer complexes, computer-instrument interfacing, applications of computers to chemical education.

D. N. Bailey, The Determination of Ascorbic Acid, J. Chem. Educ., 51, 488(1974).

D. N. Bailey, J. N. Spencer, and O. A. Moe, On the Relationship Between Cell Potential and Half-Cell Reactions, J. Chem. Educ., 53, 77(1976).

BELL, RICHARD C. (b. 1919) Assistant Professor. B.S., 1941, Lebanon Valley College, M.Ed., 1955, Temple University. General Chemistry, Chemical Education.

LOCKWOOD, KARL L. (b. 1929) Professor. B.S., 1951, Muhlenberg College, Ph.D., 1955, Cornell University. Organic Chemistry. Stereochemistry. Small-ring chemistry. Mechanisms of oxidation reactions.

S. J. Cristol, R. P. Evans, and K. L. Lockwood. Photochemical Reactions of Ketones with Some Aliphatic Ureas, J. Org. Chem., 42, 2378(1977).

MOE, JR., OWEN A. (b. 1944) Assistant Professor. B.A., 1966, St. Olaf's, Ph.D., 1971, Purdue University. Biochemistry. Enzymology, kinetics and ligand bonding, mechanism of inorganic pyrophosphatase, metal-pyrophosphate complexes.

Five publications 1973-78

J. W. Sperow, O. A. Moe, J. W. Ridlington and L. G. Butler, Yeast Inorganic Pyrophosphatase, IV. Studies on Specificity and Mechanism. J. Biol. Chem., 248, 2062(1973).

Owen A. Moe, Jr. and Gordon G. Hammes, A Study of the Binding of Thiamine Diphosphate and Thiochrome Diphosphate to the Pyruvate Dehydrogenase Multienzyme Complex, Biochemistry, 13, 2547(1974).

Owen A. Moe, Jr., D. A. Lerner, and Gordon G. Hammes, Fluoresence Energy Transfer between the Thiamine Dophosphate and Flavine Adenine Dinucleotide Binding Sites on the Pyruvate Dehydrogenase Multienzyme Complex, Biochemistry, 13, 2552(1974).

Owen A. Moe, Jr. and Sally Ann Wiest*, Determination of Stability Constants for Zinc-Pyrophosphate Complexes, Anal. Biochem., 77, 73(1977).

Owen A. Moe, Jr. and Gary Smith*, Determination of the Molecular Weight and Subunit Stoichiometry of a Protein, J. Chem. Educ., 54, 392(1977).

Grants active 1978-79; Research Corporation, $7,600, Determination of the Catalytic Role of Divalent Metal Ions in the Inorganic Pyrophosphatase Reaction.

NEIDIG, HOWARD A. (b. 1923) Chairman, Professor. B.S., 1943, Lebanon Valley College, M.S., 1946, Ph.D., 1948, University of Delaware. General Chemistry. Chemical Education. Program Editor, Modular Laboratory Program in Chemistry.

H. A. Neidig and J. N. Spencer, Introductory Laboratory Chemistry, Willard Grant Press, 1978.

H. A. Neidig and J. N. Spencer, Relative Reactivity of a Group of Metals, Chemistry, 47, 27(1974).

SPENCER, JAMES N. (b. 1941) Associate Professor. B.S., 1963, Marshall University, Ph.D., 1967, Iowa State University. Physical Chemistry. Spectroscopy and calorimetry, hydrogen bond studies.

Eighteen publications, 1973-78.

J. N. Spencer, J. E. Gleim*, M. L. Hackman*, C. H. Blevins*, and R. C. Garrett*, Spectrophotometric and Calorimetric Study of the N-H Hydrogen Bond, J. Phys. Chem., 82, 563(1978).

SPENCER, JAMES N., cont'd

J. N. Spencer, J. R. Sweigart*, M. E. Brown*, R. L. Bensing*, T. L. Hassinger*, W. Kelly*, D. L. Housel*, G. W. Reisinger*, D. S. Reifsnyder*, J. E. Gleim*, and J. C. Peiper*, Solvation Effects on the Thermodynamics of Hydrogen Bonded Systems 3. J. Phys. Chem., 81, 2237(1977).

J. N. Spencer, J. R. Sweigart*, M. E. Brown*, R. L. Bensing*, T. L. Hassinger*, W. Kelly*, D. L. Housel*, and G. W. Reisinger*, Solvation Effects II, J. Phys. Chem., 80, 811(1976).

J. N. Spencer, R. S. Harner*, and C. D. Penturelli*, Solvation Effects I., J. Phys. Chem., 79, 2488(1975).

J. N. Spencer, R. S. Harner*, L. I. Freed*, and C. D. Penturelli*, Hydrogen Bonding of Resorcinol to Ethers and Thioethers, J. Phys. Chem., 79, 332(1975).

Grants Active 1978-80: PRF, $12,500, Studies of the Hydrogen Bond.

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LOMA LINDA UNIVERSITY, La Sierra Campus
Riverside, CA 92515

Fall 1978 ug enrollment 690
Degrees offered B.A., B.S.
Telephone (714) 785-2198

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7.5 . 2. Support staff: FTE's secretary .5 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 11 Grad. school 4 Industry - Professional schools 6 Other 1 .
4. Senior majors, average past five years: 13 .
5. Students involved in research, average past five years: Acad. yr. 7 Summer none
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 15,000 % used for teaching 95% Research 5%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

Varian EM 600 Mass Spectrometer
Varian M 66 Mass Spectrometer
Varian EM 360 N.M.R.
Norelco X-Ray diffraction
Beckman Model 25 U.V.-Vis.
Varian 200 Gas Chromatograph
Hitachi/Perkin Elmer 139 U.V.
Autoprep 700 Gas Chromatograph
Perkin Elmer 237-B I.R.
Alpha Sci. E.S.R.
(Not including Loma Linda Campus

3. Library resources: Chem. abstracts? no* Volume indices? no* Collected indices? no* Total journal subscriptions? 20*/160 Computer literature search service? yes Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 4 . *Students have access to C.A. & extensive library holding on Loma Linda campus, 20 mi. by req. bus serv.
4. Computer facilities:

DEC PDP 11/40 RSTS/E Hard copy & CRT in Bldg.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

As part of regular budget. Not separated.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

None

3. Faculty teaching loads: Contact hours 15 Load credit for research? --
4. Sabbatical or leave support for research:

Approximately one summer each 2-3 years.
One faculty has ½ time research chair.

LOMA LINDA UNIVERSITY FACULTY PROFILE

ALLEN, WILLIAM M. (b. 1939) Professor and Chairman, Director of Division of Natural Science and Mathematics. B.A., 1961, La Sierra College (LLU), Ph.D., 1967, University of Maryland. *Organic Chemistry*. Organic Synthesis and Mechanisms.

GALAWAY, RONALD A. (b.) 1943) Assistant Professor. B.S., 1966, Pacific Union College, Ph.D., 1975, University of California, Riverside. *Organic Chemistry*. Mechanisms of enzyme catalyzed reactions.

M.J. Gibian and R.A. Galaway, Steady State Kinetics of Lipoxygenase Oxygenation of Unsaturated Fatty Acids, *Biochemistry*, *15*, 4209 (1976).

M.J. Gibian and R.A. Galaway, Chemical Aspects of Lipoxygenase Reactions, in *Bioorganic Chemistry*, E.E. van Tamelen, Ed., Vol. I, Academic Press, NY 1976.

HOLMES, IVAN G. (b. 1935) Professor and Dean of the College of Arts and Sciences. B.S., 1957, Arizona State University, Ph. D., 1969, Oregon State University. *Analytical Chemistry*. X-ray diffraction studies of fossil soils.

$6.000 Grant, Geoscience Research Institute.

JENKS, RODNEY L. (b. 1945) Assistant Professor. B.S. 1967 Pacific Union College, M.S. 1970, University of Arizona. *Bioorganic Chemistry*.

R.L. Jenks, T. Astrup, Englobulin Fibrinolysis in Several Species and the Effects of Some Synthetic Agents, *Progress in Chemical Fibrinolysis and Thrombolysis*, Vol. 3, Chapter 7 (1977).

C. Kluft, R. Jenks, T. Astrup, Production of Plasminogen Activator Activity in Factor XII-deficient Plasma, *Thrombosis Research 10*, 759-764 (1977).

SHELDEN, H. RAYMOND II (b. 1942) Associate Professor. B.A., 1964, Loma Linda University, Ph.D., 1969, University of California, Irvine. *Organic Chemistry*. Mechanisms, structure determination.

H.W. Moore, H. Raymond Shelden II, et. al, Diels Alder Reactions of 1,4-quinone monobenzensulfonamides, *J. Organic Chem*., in press.

H. Raymond Shelden II, Individualized Instruction in Introductory Chemisty, *J. of Chem. Ed*., *55*, 379 (1978).

Grants Active 1978-1980; National Science Foundation, Local Course Improvement, $7,200, Updating Audiotutorial Program in Introduction to Chemistry.

WEBSTER, CLYDE L. JR. (b. 1944) Assistant Professor and Associate Chairman. B.S. 1968, Walla Walla College, Ph.D., 1972, Colorado State University. *Inorganic Geochemistry*. Genetic geochemistry of uranium roll-type despsits, selenium isotope distribution patterns associated with uranium deposits, trace element profiles in fossils and processes of fossilization.

C.L. Webster, Uranium (IV) Silicate Synthesis, Proceedings of Colorado-Wyoming Academy of Science, 1971.

Grants active 1978-1979: Research Corperation Cottrell College Science Grant, $5,000, Selenium Isotope Studies of Selected Geochemical Problems. Geoscience Research Institute, $1,800, Trace Element Profiles in Western Yellowstone Fossil Forests. $10,000/year from Geoscience Research Institute.

WILSON, LELAND Y. (b. 1934) Professor, B.S., 1956, Walla College, M.S., 1960, University of Nebraska, Ph. D., 1964, University of Nebraska. *Physical Chemistry*.

ZAUGG, WAYNE E. (b. 1938) Associate Professor. B.S., 1961, Walla Walla College, Ph.D., 1965, University of Washington. *Physical Chemistry*. Alteration of Membrane Permeability by polyene antibiotics.

Grants active: R.K. Scott Memorial, National College Grants Award Program $1,500.

LUTHER COLLEGE
Decorah, Iowa 52101

Fall 1978 ug enrollment 1990

Degrees offered B.A.

Telephone 319-387-1119

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 2/3 2. Support staff: FTE's secretary 1/3 Stockrm 0 Technician 1/2
3. 1978 seniors & their placement: Total 8 Grad. school 4 Industry 0 Professional schools 2 Other 2.
4. Senior majors, average past five years: 10.
5. Students involved in research, average past five years: Acad. yr. 1 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

1 NSF Fellowship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR-JOEL Co. MiniMar
UV-Vis - (2) Beckman DB's #1401
GC - Beckman GC-2 and Beckman GC-4
IR - Beckman IR-8 and Beckman IR-4
Liquid Scintillation Counters - Beckman LS-150 and Packard Tricarb 3002
Ultracentrifuge - Beckman L3-40
Fermenter - Virtis 43-100
Continuous Flow Centrifuge-
CERA LE 741480

3. Library resources: Chem. abstracts? yes Volume indices? No Collected indices? No Total journal subscriptions? 17 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 3.
4. Computer facilities: Department: Microprocessor. Campus: PDP8E, HP 300 series 2, HP 2000 Access System.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: The Faculty Research Fund has a total of $2,500 per year which is available to individually approved projects at $500 per year.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

None

3. Faculty teaching loads: Contact hours 15 Load credit for research? None
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for ½ year. Frequency averages every 7th yr.

FACULTY PROFILE

Docken, Adrian M. (b.1913) Professor. B.A., 1937, Luther College, Ph.D. 1941, University of Wisconsin. *Organic Chemistry*. Synthesis and chemistry of bicyclo-(3,3,0) octa-1, 5-diene-3, 7-dione.

Heino, Walden L. (b.1930) Associate Professor. B.S., 1953, University of Minnesota, Ph.D., 1957, University of Minnesota. *Inorganic Chemistry*. Optically active coordination compounds.

Koeltzow, Donald E. (b.1944) Associate Professor and Chairman. B.S., 1966, New Mexico Institute of Mining and Technology, M.S., 1968, University of Illinois, Ph.D., 1070, University of Illinois. *Biochemistry*. Structural analysis of membrane components.

P. Gemski, Jr., D.E. Koeltzow, and S.B. Formal, Phage Conversion of *Shigella flexneri* Group Antigens, *Infection and Immunity*, *11*, 685 (1975).

Mottley, Carolyn. (b. 1947) Assistant Professor. B.S., 1969, Wayland Baptist College, Ph.D., 1973, University of North Carolina, Chapel Hill. *Physical Chemistry*. Effects of tunnelling on NMR lineshapes in solids.

Eleven publications, 1973-1978.

C.S. Johnson, Jr. and C. Mottley, Theory of the Temperature Dependence of the NMR Spectrum of a Tunnelling Methyl Group . *Journal of Physics C*: 9, 2789 (1976).

C. Mottley, L.D. Kispert, O.S. Wang, An Eldor Study of Methyl Radical Production at 77°K in Irradiated Acetate Crystals as a Function of Metal Cation , *Journal of Physical Chemistry* *80*, 1885 (1976).

A.D. Trifunac, D.F. Nelson and C. Mottley, Chemically Induced Dynamic Electron Polarization. Examples of S-$T_{\pm}$, Polarization, Accepted for publication in *Journal of the American Chemical Society*.

D.J. Nelson, C. Mottley and A.D. Trifunac, CIDNP in the Radiolysis of Aqueous Methanol, Indication of Methyoxy Radical Involvement, *Chemical Physics Letters*, *55*, 323 (1978).

Cornelius, Craig W. (b. 1956) Assistant Professor. B.A., 1974, Luther College Ph.D., 1978, Stanford University. *Physical Chemistry*. Depolarized light scattering from polymers.

C. Stein, S. Bouma, J. Carlson, C. Cornelius, J. Maeda, C. Weschler, E. Deitsch, and R.O. Hodgson, Structural Characterization and Resulting Implications for the Mechanism of Formation of Bis (2-mercaptoethylamine) ethylenediamine-chromium (III) Perchlorate, *Inorganic Chemistry*, *15*, 1183 (1976).

MACALESTER COLLEGE

St. Paul, MN 55105

Fall 1978 ug enrollment 1700

Degrees offered B.A.

Telephone (612)-647-6351

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5-1/2 2. Support staff: FTE's secretary 1/4 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 21 Grad. school 5 Industry 6 Professional schools 6 Other 4.
4. Senior majors, average past five years: 17.
5. Students involved in research, average past five years: Acad. yr. 3 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

Five NSF Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 14,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60MHz (JEOL C-60HL)
MS (Varian EM600)
UV-Vis (Beckman 25 & DK2A
AA (Beckman)
GC (Beckman 45)
IR (Beckman 5A)

3. Library resources: Chem. abstracts? * Volume indices? * Collected indices? * Total journal subscriptions? 19 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? 1/2 Standing orders for review series and annual reviews (past five years) 15.
   *Chem. Abstracts is complete through 1976 - was discontinued in 1977.
4. Computer facilities:

   Campus; PDP 11/70; 15 terminals distributed in various science labs and classrooms.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $2000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   none

3. Faculty teaching loads: Contact hours 12 Load credit for research? none
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary for full year or full salary for 1/2 year.

CARLSON, JANET L. (b.1952) Assistant Professor. B.A., 1974, Hamline University, Ph.D., 1978, Stanford University. *Organic Chemistry*. Organic synthesis (natural products and synthetic methods), design and synthesis of enzyme inhibitors.

C. Stein, S. Bouma, J. Carlson, C. Cornelius, J. Maeda, C. Weschler, E. Deutsch and K.O. Hodgson, Structural Characterization and Resulting Implications for the Mechanism of Formation of Bis(2-mercaptoethylamine)ethylenediaminechromium (III) Perchlorate, $[(en)Cr(SCH_2NH_2)_2]ClO_4$, *Inorganic Chemistry*, *15*, 1183(1976).

PARSON, KATHLEEN A., (b.1945) Assistant Professor. B.A., 1967, Macalester College, Ph.D., 1974, University of Minnesota. *Biochemistry*. Membrane-DNA associations in virus-infected bacteria.

D.P. Snustad, C.J.H. Bursch, K.A. Parson and S.H. Hefeneider, Mutants of Bacteriophage T4 Deficient in the Ability to Induce Nuclear Disruption: Shutoff of Host DNA and Protein Synthesis, Gene Dosage Experiments, Identification of a Restrictive Host, and Possible Biological Significance, *J. Virology*, *18*, 268(1976).

D.P. Snustad, M.A. Tigges, K.A. Parson, C.J.H. Bursch, F.M. Caron, J.F. Koerner and D.J. Tutas, Identification and Preliminary Characterization of a Mutant Defective in the Bacteriophage T4-Induced Unfolding of the *Escherichia coli* Nucleoid, *J. Virology*, *17*, 622(1976).

K.A. Parson and D.P. Snustad, Host DNA Degradation After Infection of *Escherichia coli* with Bacteriophage T4: Dependence of the Alternate Pathway of Degradation Which Occurs in the Absence of Both T4 Endonuclease II and Nuclear Disruption on T4 Endonuclease IV, *J. Virology*, *15*, 221(1975).

D.P. Snustad, K.A. Parson, H.R. Warner, D.J. Tutas, J.M. Wehner and J.F. Koerner, Mutants of Bacteriophage T4 Deficient in the Ability to Induct Nuclear Disruption II. Physiological State of the Host Nucleoid in Infected Cells, *J. Mol. Biol.*, *89*, 675(1974).

K.A. Parson, H.R. Warner, D.L. Anderson and D.P. Snustad, Nuclear Disruption and Binding of Intermediates in Host DNA Breakdown to Membranes Following Infection of *Escherichia coli* with Bacteriophages T4 and T7, J. *Virology*, *11*, 806(1973).

SCHWARTZ, A. TRUMAN (b. 1934) Professor. A.B., 1956, University of South Dakota, B.A., 1958, Oxford University, M.A., 1960, Oxford University, Ph.D., 1963, Massachusetts Institute of Technology. *Physical Chemistry*. Physical chemistry of proteins, history of chemistry.

J.F. Brandts, L. Erickson, K. Lysko, A.T. Schwartz, and R. D. Taverna, Calorimetric Studies of the Structural Transition of the Human Erythrocyte Membrane: The Involvement of Spectrin in the A Transition, *Biochemistry*, *16*, 3450(1977).

A. Truman Schwartz, The History of Chemistry; Education for Revolution, *J. Chem. Educ.*, *54*, 467(1977).

A. Truman Schwartz and George B. Kauffman, Experiments in Alchemy, Part I, *J. Chem. Educ.*, *53*, 136(1965); Part II, *J. Chem. Educ.*, *53*, 235(1976).

A. Truman Schwartz, section editor, Impact: Science on Society, Robert Wolke, general editor, W. B. Saunders, Philadelphia, 1975.

A. Truman Schwartz, Chemistry: Imagination and Implication, Academic Press, New York, 1973.

SLOWINSKI, EMIL J. (b.1922) Professor. B.S., 1946, Massachusetts State College, Ph.D., 1949, Massachusetts Institute of Technology. Physical Chemistry. Quantum mechanics of simple systems.

Several texts and laboratory manuals, 1973-78

W. L. Masterton and E.J. Slowinski, Chemical Principles, 4th edition, 1977

(two alternate versions of above text, one using S.I. units, and the other including a course in qualitative analysis, both 1978)

E.J. Slowinski, W.C. Wolsey, and W. L. Masterton, Chemical Principles in the Laboratory, 2nd edition, 1973.

(two alternate versions of the above text, one in S.I. units, 1978, and one including qualitative analysis, 1974).

W.L. Masterton and E.J. Slowinski, Elementary Mathematical Preparation for General Chemistry, 1974.

All of the above books were published by W.B. Saunders Company.

STOCKER, FRED B. (b. 1931) Professor and Chairman. B.S., 1953, Hamline University, M.S., 1955, University of Minnesota, Ph.D., 1958, University of Colorado. Organic Chemistry. Heterocyclic chemistry, especially of imidazoles and pyrimidines.

WOLSEY, WAYNE C. (b.1936) Associate Professor. B.A., 1958, Michigan State University, Ph.D., 1962, University of Kansas. Inorganic Chemistry. Complexes and other compounds of transition elements.

W.C. Wolsey, Variation of Radioactive Decay Rates, J. Chem. Educ., 55, 302(1978).

E.J. Slowinski, W. C. Masterton, and W.C. Wolsey, Chemical Principles in the Laboratory, W. B. Saunders, Philadelphia, 1969, 1973, 1977.

E.J. Slowinski, W.C. Wolsey, and W.L. Masterton, Chemical Principles in the Laboratory with Qualitative Analysis, W. B. Waunders, Philadelphia, 1974.

W.C. Wolsey, Perchlorate Testing in Chemical Apparatus and Hoods, J. Chem. Educ, 51, A289(1974).

W.C. Wolsey and T. Moeller, Weak and Unstable Anionic Bromo and Iodo Complexes, (preparation checked by authors), Inorganic Syntheses, 15, 225(1974).

MANHATTAN COLLEGE and
COLLEGE OF MT. ST. VINCENT ON HUDSON

Riverdale, NY 10471
(Joint Department)

Fall 1978 ug enrollment 4054
Degrees offered B.S.Biochem.
B.S.Chem.
B.A.Chem.
Telephone (212) 548-1400 ext. 206

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 17*. 2.Support staff: FTE's secretary 1 Stockrm 2 Technician 0
3. 1978 seniors & their placement: Total 29 Grad. school 9 Industry 13
   Professional schools 4 Other 3.
4. Senior majors, average past five years: 23.
5. Students involved in research, average past five years: Acad. yr. 11 Summer 11.4
6. National student honors, past five years (NSF fellowships, etc.)
   NSF Fellowship Award: Honorable Mention, K. Glogovsky
   NSF Fellowship Award: Honorable Mention, N. Marano
   NSF Scholarship, M. Bradicich
   National Medical Fellowship, P. Pons

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 18,000 % used for teaching 78% Research 22%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR Varian T-60
   IR PE 621, PE 337, PE 137
   MS Varian EM 600
   UV-VIS Cary 14, Beckman DB(2), Beckman DU(2)
   X-ray GE XRD 5
   AA PE 290
   GC FM 810, Gow Mac 750
   Rudolph Recording Polarimeter
   Spinco Ultracentrifuge
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes
   Total journal subscriptions? 51 Computer literature search service? No
   Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 20.

4. Computer facilities: DEC PDP 11/70; a remote terminal provides access to a CDC 6600 Computer

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Variable, including individual Summer Grants.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: NSF-LOCI Grant, $21700, NSF-URP Grant, $9910, NSF Undergraduate Institutional Improvement Program, $6100.

3. Faculty teaching loads: Contact hours 13 Load credit for research? Yes

4. Sabbatical or leave support for research: Faculty can apply for Sabbatical Leave at 50% salary for full year or full salary for ½ year every seven years.

*Including FTE of Laboratory Assistants

FACULTY PROFILE

BADDING, VICTOR G. (b. 1935) Associate Professor. B.S., 1957, Canisius College, Ph.D., 1961, University of Notre Dame. Organic Chemistry. Grignard Reactions of Acetals and Ketals.

Grant: Electroplaters Society Grant, $19,500, Analysis of Cyanide in Electroplating Waste Water.

BARILE, RAYMOND C. (b. 1936) Associate Professor. B.S., 1958, Manhattan College, M.S., 1960, Fordham University, Ph.D., 1965, Fordham University. Physical Chemistry. Kinetics and mechanism of substitution and electron transfer reactions involving transition metal analogs of biochemical systems. Development of Unified Laboratory Sequence.

Grant: NSF LOCI Grant, $21,700, Integration of Analytical, Physical and Inorganic Laboratories.

CHAROLA, A. ELENA (b. 1942) Assistant Professor. Licenciado en Quimica, 1967 (Analitica), 1969 (Industrial), Doctor en Quimica, 1974, Universidad Nac. La Plata, Argentina. Physical/Analytical Chemistry. Chemistry of the solid state, polymorphism, X-ray diffraction, scanning electron microscopy, electroanalytical chemistry.

A.E. Charola and H.A. Alderuccio, Estudio de la corrosion y pasivacion del hierro empotrado en probetas de morteros de cemento portland puras y adicionadas con escorias granuladas granuladas de altos hornos, Anales de la Sociedad Cientifica Argentina, 198, 23 (1974).

A.E. Charola and S.Z. Lewin, Effect of Milling on the Crystal Structures of Chrysotile and other Serpentine Minerals, Advances in X-ray Analysis, Vol.19, 685 (1976).

A.E. Charola, S.Z. Lewin and M.J. Yoder, Pseudocrystals of Chyrsotile, Journal of Crystal Growth, 39, 305 (1977).

A.E. Charola and S.Z. Lewin, Scanning Electron Microscopy in the Diagnosis of "Diseased" Stone, Scanning Electron Microscopy, Vol.1, 695 (1978).

A.E. Charola and S.Z. Lewin, X-ray Powder Diffraction Investigation of the Monumental Stone of the Castel dell'Oro, Naples, Italy, Advances in X-ray Analysis (in print).

KIRCHNER, RICHARD M. (b. 1941) Assistant Professor. A.B., 1964, University of California at Berkeley, M.S., 1966, California State University at San Jose, Ph.D., 1971, University of Washington (Seattle). Inorganic and Structural Chemistry. Synthesis and characterization of coordination compounds with small ligands containing only sulfur and oxygen, organometallic compounds, and transition metal cluster compounds. X-ray crystallography.

Fifteen publications, 1973-1978.

E.M. Flanigen, J.M. Bennett, R.W. Grose, J.P. Cohen, R.L. Patton, R.M. Kirchner, and J.V. Smith, Silicalite, A New, Hydrophobic, Crystalline Silica Molecular Sieve, Nature, 271, 512-516 (1978).

R.M. Kirchner, R.G. Little, K.D. Tau, and D.W. Meek, The Crystal and Molecular Structure of the Dimethylplatinum(II) Complex of 1,1,1-Tris(diphenylphosphinomethyl) ethane, J. Organometal. Chem., 149, C15-C18 (1978).

R.M. Kirchner and J.A. Ibers, The Structure of μ-carbonyl-μ-dicyanovinylidene-bis(carbonylcyclopentadienyliron(0)), CIS-$Fe_2(CO)_2(\pi\text{-}C_5H_5)_2(\mu\text{-}CO)[\mu\text{-}C{=}C(CN)_2]$, J. Organometal. Chem., 82, 243 (1974).

R.M. Kirchner, T.J. Marks, J.S. Kristoff, and J.A. Ibers, Structural and Dynamic Systematics in the Isoelectronic Series $((C_5H_5)ML_2)_2$, where M = Cr, Mn, Fe, and L = CO, NO, J. Amer. Chem. Soc., 95, 6602 (1973).

KIRCHNER, RICHARD M., cont'd

T.E. Nappier, Jr., D.W. Meek, R.M. Kirchner, and J.A. Ibers, Activation and Stabilization of Small Molecules by a Chelating Triphosphine Rhodium(I) Complex, A Correlation of the Chemistry with the Structure of Chlorobis(3-diphenylphosphinopropyl)phenylphosphine Rhodium(I) and its Nitrosyl Derivative, J. Amer. Chem. Soc., 95, 4194 (1973).

Grant: ACS-Petroleum Research Fund Grant, $11,000, 9/1/77 to 8/31/79, The Preparation and Characterization of a Rhodium Metal Complex Containing a Sulfur Monoxide Ligand, SO.

KRONSTEIN, MAX (b. 1895) Research Associate. Ph.D., 1922, University of Leipzig (Germany). Organic Chemistry. Polymer chemistry, organometallic reaction coatings.

Nine publications, 1973-1978.

M. Kronstein, Releases from Organotin and from Organolead Antifouling Paints, Proceedings, 5th International Symposium on Controlled Release of Bioactive Materials, August 1978, at National Bureau of Standards, Gaithersburg, Maryland.

M. Kronstein, Lecithin Modified Pigmentations, Modern Paint and Coatings, Vol.68, No.2, p.59-63 (1978).

D.S. Carr and M. Kronstein, Marine Antifoulant Proves Versatility, Modern Paint and Coatings, Vol.67, No.11, P.41-47 (1977).

M. Kronstein, New Analysis of Organolead Toxicant Release, Modern Paint and Coatings, 67, No.8, p.57-61 (1977).

M. Kronstein and *C.R. Denninger, Cuprous Oxide Antifoulants, Modern Paint and Coatings, Vol.66, No.10, p.29-36 (1976).

MAHONY, JOHN D. (b. 1931) Associate Professor. B.S., 1951, St. John's University, M.S., 1953, University of Connecticut, Ph.D., 1965, University of California at Berkeley. Nuclear Chemistry. Nuclear reactions and nuclear fission. Experimental determination of cross sections for heavy ion projectile systems using tract detector techniques.

MICHIELS, (Brother) LEO P. (b. 1928) Assistant Professor. A.B., 1953, Manhattan College, M.A., 1959, Manhattan College, M.S., 1964, University of Detroit, Ph.D., 1968, University of Detroit. Physical/Inorganic Chemistry. Synthesis and characterization of binuclear cyanoferrates. Synthesis and characterization of transition metal cluster compounds with disulfides. Development of computer programs from unified laboratory sequence.

MILLER, HERBERT K. (b. 1921) Professor and Chairman. B.S., 1940, College of City of New York, M.S., 1947, University of Illinois, Ph.D., Columbia University. Biochemistry. Purine Metabolism; methylation of macromolecules.

H.K. Miller and M.E. Balis, Studies on the Mechanism of Inhibition of tRNA Methylation by 3,4-dihydroxyphenylalanine, Biochim. Biophys. Acta, 474, 435 (1977).

M.L. Moller, H.K. Miller and M.E. Balis, Effects of Amines on Macromolecular Methylation, Biochim. Biophys. Acta, 475, 425 (1977).

NEWMAN, PAUL (b. 1924) Associate Professor. B.S., 1945, City Collge of New York, M.A., 1952, Brooklyn College, Ph.D., 1962, New York Univeristy. Organic Chemistry. Development of new methods for the optical resolution of chemical compounds, structural and mechanistic stereochemistry.

Book: Optical Resolution Procedures for Chemical Compounds. Volume 1-Amines and Related Compounds (1978).

PALMER, RICHARD E. (b. 1943) Assistant Professor. B.A., 1965, Washington and Jefferson College, Ph.D., 1971, Michigan State University. Biochemistry. Carbohydrate metabolism. Mechanism of action of steroid hormones in cell culture systems.

E.R. Stanley, R.E., Palmer, and U. Sohn, Schionogi Carcinoma 115: Methods for the Quantitative Analysis of Hormone Dependence and Autonomy In Vitro, Cell, 10, 35-40 (1977).

R.L. Anderson, and R.E. Palmer, Phosphocellobiase, Methods in Enzymology, Vol. XLII, Part C, pp.494-497. W.A. Wood(editor), Academic Press, 1975.

R.L. Anderson, and R.E. Palmer, -glucoside Kinase, Methods in Enzymology, Vol. XLII, Part C, 3-6. W.A. Wood(editor), Academic Press, 1975.

PIERPAOLI, ALESSANDRO R. (b. 1944) Assistant Professor. B.S., 1966, Pratt Institute, M.S., 1968, Ph.D., 1978, Stevens Institute of Technology. Physical Chemistry. Mass spectrometry; energy deposition, excitation transfer and reaction mechanisms in gas phase ion molecule systems; ion chemistry and physics; instrumental design.

SEARLES, ARTHUR LANGLEY (b. 1920) Professor. B.A., 1942, Ph.D., 1946, New York University. Organic Chemistry. Nitrogen heterocycles; beta-ketoanilides; cyclizations.

WASACZ, JOHN P. (b. 1944) Associate Professor. B.S., 1965, St. John's University (N.Y.), Ph.D., 1969, University of Pennsylvania. Organic Chemistry. Synthesis of methadone analogues, small heterocyclic rings, heterocyclic photochemistry.

J.P. Wasacz, M.M. Joullie, U. Mende, I. Fuss, and G.W. Griffin, Photochemistry of 2,2,4,4-tetraphenyloxetan-3-one. Intermediates in the Photofragmentation of Aryl Substituted Oxiranes, J. Org. Chem., 41, 572 (1976).

ZIELINSKI, THERESA JULIA (b. 1941) Assistant Professor. B.S., 1963, Fordham University, M.S., 1968, Fordham University, Ph.D., 1973, Fordham University. Physical Chemistry-Molecular Orbital Theory. Molecular orbital studies of biological molecules, pharmaceuticals, and carcinogens.

T.J. Zielinski, D.L. Breen, R. Rein, A MINDO/3 Study of Some Hydrogen Bonded Systems, J. Am. Chem. Soc., 100, 6266 (1978).

T.J. Zielinski and R. Rein, Optimum Geometries and Relative Energies for Cytosine, Thymine, Uracil, the Imino Tautomer of Cytosine, the Enol Tautomer of Thymine, and the Enol Tautomer of Uracil by the MINDO/3 SCF Method, International Journal of Quantum Chemistry, Proceedings of the Boulder Conference (1978). In press.

T.J. Zielinski, D.L. Breen, K. Haydock, R. Rein, R.D. MacElroy, Optimized Geometries and Relative Energies for Guanine, the Imino-Enol Tautomer of Guanine, the Enol Tautomer of Guanine, Adenine, and the Imino Tautomer of Adenine as Found by the MINDO/2 SCF MO Method, International Journal of Quantum Chemistry: Quantum Biology Symposium 5, (1978). In press.

MARIETTA COLLEGE
Marietta, OH 45750

Fall 1978 ug enrollment 1350
Degrees offered B.S. and B.A.
Telephone (614) 373-4643

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 3/4 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 9 Grad. school 4 Industry 2
   Professional schools 3 Other 0 .
4. Senior majors, average past five years: 8 .
5. Students involved in research, average past five years: Acad. yr. 7 Summer 0
6. National student honors, past five years (NSF fellowships, etc.)

   none.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 25,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

   NMR (Varian T-60)
   MS (Varian EM-600)
   UV-Vis (Beckman DU-2 and DB)
   AA (Southern Analytical A 3000)
   Liquid Scintillation (Packard 2009)
   GC (Bendix 2100)
   IR (AccuLab 10)
   Electroscan-30 (Beckman)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? No
   Total journal subscriptions? 28 Computer literature search service? No
   Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 22 .
4. Computer facilities: Campus: Interdata 8/32 computer, interactive CRT terminals and graphics printers.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $1,500/yr. chemicals and glassware; $2,500-$4,000/yr. for equipment.
2. Departmental grants (list Dreyfus, du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   American Cyanamid Faculty Support Grant - $2,500.
   NSF-ISEP - $4,400.
3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for ½ year. Faculty can apply every 7th year.

FACULTY PROFILE

GILDE, HANS-G. (b. 1933) Professor. B.S., 1957, Albright College, Ph.D., 1961, Ohio University. Organic Chemistry. Electro-organic chemistry, organic synthesis, and applied spectroscopy.

P. Rademacher and H.-G. Gilde, Translator, Chemical Carcinogens, J. Chem. Ed., 53, 757(1976).

H.-G. Gilde, Focal Point of Learning, Ohio Library Assoc. Bull.,44,17(1974).

J. P. Coleman, Naser-ud-din, H.-G. Gilde, J. H. P. Utley, and B. C. L. Weedon, Electro-organic Reactions, Part I, J. Chem. Soc. (II), 1903(1973).

R. Huisgen and H.-G. Gilde, Translator, Rudolph Criegee, J. Chem. Educ., in press.

Grant active 1978-79: NSF-ISEP Grant, $4,400.

GROSE, HERSCHEL G. (b. 1921) Professor. B.S., 1942, Indiana Central College, Ph.D., 1951, Indiana University. Organic Chemistry. Organic synthesis and polymer chemistry.

HOHMAN, WILLIAM H. (b. 1939) Associate Professor and Chairman. B.S., 1961, Mount Union College, Ph.D., 1966, Ohio University. Inorganic Chemistry. Synthesis and photochemistry of transition metal coordination compounds; biologically significant metal complexes.

W. H. Hohman, A Combined Infrared and Kinetic Study of Linkage Isomers, an Inorganic Experiment, J. Chem. Educ., 51, 553(1974).

KNECHT, LAURANCE A. (b. 1932) Professor. B.S., 1953, University of Illinois, Ph.D., 1959, University of Minnesota. Analytical Chemistry. Trace metal analysis, electroanalytical methods, and analysis of environmental materials.

L. A. Knecht, An Inexpensive Push-Button Flow-Limited Distilled Water Faucet, J. Chem. Educ., in press.

THOMPSON, ARTHUR C. (b. 1919) Associate Professor. B.S., 1946, Wayne State University, M.S., 1949, Ph.D., 1956, Washington State University. Physical Chemistry. Solutions of high polymers; charge transfer complexes.

WALKER, ROBERT G. (b. 1944) Assistant Professor. B.A., 1966, Hiram College, Ph.D., 1972, Purdue University. Biochemistry. Level and functions of gangliosides in developing chick embryo.

MERCER UNIVERSITY
Macon, GA 31207

Fall 1978 ug enrollment 1910
Degrees offered B.S., B.A.
Telephone (912) 745-6811

DEPARTMENT PROFILE

Student, Facuty & Staff Base

1. Faculty: FTE 5 , 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 12 Grad.School 6 Industry 2 Professional Schools 4 Other 0 .
4. Senior majors, average past five years: 9 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,000 % used for teaching 90 Research 10
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Varian EM360)
MS (Varian EM600)
3-IR's (Beckman Acculabs 2,3 & 4)
UV-Vis (Beckman DBG)
6-GLC's (2 H-P 700's; 2 Gow-Mac; 2 Carles150's)
High Pressure Lab Reactor (Parr)
Controlled Atmosphere Glove Box
Coulometric Power Supply (S-W)
X-Y Recorder (Houston Inst. 2000)
Faraday magnetic Susceptibility Apparatus

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 27 Computer literature search service No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) N/A .

4. Computer facilities: Terminals & Remote Job Entry to CDC CYBIA 7400 at Georgia Tech; on campus interdata minicomputer 716.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $1,000/year for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

3. Faculty teaching loads: Contact hours 14 Load credit for research? seldom .

4. Sabbatical or leave support for research: Faculty can apply for leave at 50% salary for full year, full salary for 1/2 year.

FACULTY PROFILE

CRAWFORD, VAN H. (b. 1946) Assistant Professor, B.S., 1968, Denison University, Ph.D., 1976, University of North Carolina. Inorganic Chemistry. Magnetic electronic, and structural properties of copper complexes.

Robert F. Drake, Van H. Crawford, and William E. Hatfield, "Magnetic Studies on μ_4-OxO-hexa-μ-chlorotetrakis [(pyridine)copper(II)]", J. Chem. Phys., 60, 4525 (1974).

Van H. Crawford, H. Wayne Richardson, John R. Wasson, Derek J. Hodgson, and William E. Hatfield, "Relationship between the Singlet-Triplet Splitting and the Cu-O-Cu Bridge Angle in Hydroxo-Bridged Copper Dimers", Inorg. Chem., 15,2107(1976).

Van H. Crawford, William E. Hatfield, and Robert E. Tapscott, "Magnetic Studies of Vandyl(IV) Tartrate Dimers", J. Mol. Struct., 38, 141 (1977).

Van H. Crawford and William E. Hatfield, "Exchange Interactions in Halide-Bridged Chains of Copper(II) $Cu(Rpy)_2X_2$", Inorg. Chem., 16, 1336 (1977).

Van H. Crawford and William E. Hatfield, "Magnetic Properties of Tetrasodium Bis(d,ℓ-tartrate) dicuprate(II) Decahydrate", J. Mol. Struct. 37, 157 (1977).

FURSE, CLARE T. (b. 1931) Professor, B.S., 1957, University of Utah, Ph.D., 1961, University of Utah. Analytical Chemistryl Electromistry of copper complexes; computer based instructional methods.

C. T. Furse, Study Guide to Accompany CHEMISTRY, McGraw-Hill Book Co., 1978.

HARGROVE, ROBERT J. (b. 1942) Assistant Professor, B.A. 1964, Ohio Wesleyan University, Ph.D., 1974, University of Utah. Organic Chemistry. Vinyl cations, allene synthesis, alternative energy sources.

P. J. Stang, R. J. Hargrove, and T. E. Dueber, "Secondary Deuterium Isotope Effects in the Solvolysis of Ring-substituted Styryl Trifluoromethanesulfonates", J. Chem. Soc. Perkin Trans II , 1486 (1977).

R. J. Hargrove and P. J. Stang,"Solvolysis of Medium Ring Size Cycloalkenyl Triflates",Tetrahedron, 32, 37 (1976).

P. J. Stang and R. J. Hargrove,"Vinyl Triflates in Synthesis. II. 1,1-Di-, Tri-, Tetrasubstituted and Deuterio Allenes from Ketones via Vinyl Triflates", J. Org. Chem. 40, 687(1975).

R. J. Hargrove and P. J. Stang,"Vinyl Triflates in Synthesis I. tert-Butylacetylene", J. Org. Chem. 39, 581 (1974).

JAMES, FRANKLIN W. (b. 1922), Professor and Chairman, B.S., 1947, Mississippi College, Ph.D., 1952, University of North Carolina. Analytical Chemistry

MARQUART, JOHN R. (b. 1932), Professor, B.S., University of Arizona, 1955, Ph.D., 1963, University of Illinois. Physical Chemistry. Vapor composition of the magnesium halides, sulfur, and some transition metal chlorides and oxychlorides; single pulse shock tube studies.

J. R. Marquart, R. L. Belford, and H. A. Fraenkel, "Pyrolytic Production of $Se(^3p)$ from Caron Diselenide--1. Equilibrium", International J. Chem. Kinetics, 9, 671 (1977).

MIDDLEBURY COLLEGE
Middlebury, VT 05753

Fall 1978 ug enrollment 1905
Degrees offered B.A.
Telephone (802) 388-7954

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 7 Grad. school 1 Industry 1 Professional schools 3 Other 2 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

one NSF fellowship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 29,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60MHz(P-E R20)
IR - 1 P-E 457; 2 P-E 727
UV-Vis Carey 15
UV-Vis w. auto-cuv. (Gilford 250)
X-Ray diff. - fluor. (G.E.XRD6)
AA (PE 103)
GC w. prep. attach. (H-P5750)
Cent., refrig. (duPont RC-5B)
Ultra Cent. (Beck. L2-65)
L.S.S. Packard Tri-Carb

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 44 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 45 .

4. Computer facilities: College; PDP-11/45-RSTS/E operating systems, 14 terminals, 4 in the Science Center. Physics Dept. - available to Chem. PDP-11-V03; 32 Channel A to D converter.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $4,000/yr. chemicals & glassware; $3,000/yr. for equipment. Two faculty research grants @ $1,060 (total $2,120 for 2 research assistants).
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: For 1977-78
Dreyfus Foundation $30,000; ISEP - $17,500

3. Faculty teaching loads: Contact hours 10 Load credit for research? No

4. Sabbatical or leave support for research: Faculty may apply for leave of absence for spring or fall term plus winter term at full pay or 5/9 salary full year. Frequency variable - average is about every 8th year.

BENNETT, DAVID A. (b. 1942) Assistant Professor. A.B., 1964, Muskingum College, M.A.T., 1965, Northwestern University, Ph.D., 1973, Cornell University. *Bioinorganic Chemistry*. Biochemical studies and bioinorganic model studies of mettalloenzymes.

*J.A. Symanski and D.A. Bennett, Single-Wavelength Spectrophotometric Assay for Tryptophan Oxygenase, *Analytical Biochemistry*, *79*, 419(1977).

W.C. Crouse, D.A. Bennett, and D.W. Margerum, Kinetics of Dissociation of Metal Cyanide Complexes Using Iodine as a Scavenger for Cyanide Ion, *React. Kinet. & Cat. Letters*, *1*, 135(1974).

GLEASON, ROBERT W. (b. 1932) Professor and Chairman of Natural Science Division. B.A., 1954, M.S. 1956, Middlebury College, Ph.D., 1960, Massachusetts Institute of Technology. *Organic Chemistry*. Reduction of substituted N-nitrosodibenzylamines and oxidation of substituted dibenzyl hydrazines.

English translation by R.W. Gleason of von Harald Günther's NMR-Spektroskopie to be published by John Wiley this winter (1979).

R.W. Gleason and *J.F. Paulin, Abnormal Reduction of N-Nitroso-bis-(2,4,6-trimethylbenzyl)amine with Lithium Aluminum Hydride, *J. Chem. Soc.*, *Chem. Comm.*, (1973), 98.

HARNEST, GRANT H. (b. 1916) Professor. A.B., (1939), Knox College, M.S. (1941) Middlebury College, Ph.D. (1946) University of Virginia. *Organic Chemistry*. Synthetic analgesics, heterocyclic amino alcohols.

POOL, EDWIN L. (b. 1921) Professor. B.S., 1943, M.S., 1949, Ph.D., 1952, Iowa State University. *Analytical Chemistry*. Trace analysis, metal ions; environmental analysis.

ROBERTS, E. KIRK. (b. 1922) Professor and Chairman. B.A., 1949, Earlham College, Ph.D., 1953, Harvard University. *Physical Chemistry*. Properties of complexes of transition metal ions with polyfunctional chelating ligands.

Elementary Physical Chemistry to be published by Allyn and Bacon, spring 1980.

TATUM, CHARLES M. JR. (b. 1947) Assistant Professor. B.A., 1969, Amherst College, Ph.D., 1976, The Pennsylvania State University. *Bioorganic Chemistry*. Chemistry and biochemistry of folic acid derivatives.

Eight publications, 1972-78.

C.M. Tatum, A Simple and Inexpensive Universal Pipet Bulb, *Journal of Chemical Education*, *55*, 38(1978).

S.J. Benkovic and C.M. Tatum, Mechanisms of Folate Cofactors, *Trends in Biochemical Sciences*, *2*, 161(1977).

C.M. Tatum, J. Vederas, E. Schleicher, S.J. Benkovic and H.G. Floss, Stereospecificity of Thymidylate Synthetase, *Journal of the Chemical Society*, *Chemical Communications*, 218(1977).

C.M. Tatum, P.A. Benkovic, S.J. Benkovic, R. Potts, E. Schleicher, and H.G. Floss, Stereochemistry of Methylene Transfer Involving 5,10-Methylenetetrahydrofolate, *Biochemistry*, *16*, 1093(1977).

L. Schirch, C.M. Tatum, and S.J. Benkovic, Serine Transhydroxymethylase: Evidence for a Sequential Random Mechanism, *Biochemistry*, *16*, 410(1977).

Research Corporation Grant, 1977-79, $10,000.

MUSKINGUM COLLEGE

New Concord, Ohio 43762

Fall 1978 ug enrollment 950

Degrees offered B.A., B.S.

Telephone (614) 826-8234

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4.3. 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0.25
3. 1978 seniors & their placement: Total 9 Grad. school 1 Industry 5 Professional schools 2 Other 1.
4. Senior majors, average past five years: 9.2.
5. Students involved in research, average past five years: Acad. yr. 9 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR Varian T-60
IR Beckman IR-20A
UV-V Cary 15
UV-V Perkin-Elmer 124
IR Perkin-Elmer 237
Lidqud Scintilation Counter - Nuclear Chicago

GC Varian 700
GC Hewlett-Packard 5750
HPLC DuPont 841
AA Techtron 120
Polarograph Sargent XV

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 23 Computer literature search service? Yes Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 10.

4. Computer facilities: PDP 11/45, PDP-8, Heath H-8, 1 videographic terminal, 2 videoalphanumeric terminals, 18 hard copy terminals.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $4200

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
Lubrizol $500

3. Faculty teaching loads: Contact hours 13 Load credit for research? 0

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 75% salary for full year or full salary for 1/2 year. Application can be made every 7th year.

FACULTY PROFILE

GERLACH, EDWARD R., Chairman (b.1931) Associate Professor. B.S., 1956, Muskingum College, M.S. 1962, Ohio State University. Analytical Chemistry. Trace metals in the environment and Zinc/copper in body fluids.

E.R. Gerlach, book review, Chemistry: An Ecological Approach. Gymer, JACS 95, 6515 (1974).

E.R. Gerlach, book review, Environmental Pollution, L. Hodges, JACS 95, 7191 (1974).

E.R. Gerlach, A Science Writing Experience for Undergraduate Students, Journal College Science Teaching, V, 122 (1975).

GROTZINGER, ERIC W. (b.1946) Assistant Professor. B.A., 1969, Gettysburg College, Ph.D., 1974, University of Pittsburgh. Biochemistry. Isolation and characterization of natural products and the study of their metabolism in plants.

E. Grotzinger and I.M. Campbell, 4-(2'-Carboxyphenyl)-4- oxoburtyrate: An Obligatory Intermediate in Lawsone Biosyn thesis, Phytochemistry, 13, 923 (1974).

C.P. Nulton, J.D. Naworal, I.M. Campbell, E.W. Grotzinger, A Combined Radio Gas Chromatograph/Mass Spectrometer Detects Intermediates in Mycophenolic Acid Biosynthesis, Analytical Biochemistry, 75, 219 (1976).

LANDOLT, ROBERT G. (b.1939) Associate Professor. B.A. 1961, Austin College, Ph.D. 1965, University of Texas at Austin. Organic Chemistry. Mechanism and scope of reactions of aromatic nitroso compounds and of hypohalite oxidations of aromatic substances, including coal.

R.G. Landolt, Oxidation of Coal Models: Reaction of Aromatic Compounds with Sodium Hypochlorite, FUEL, 54, 299 (1975).

*J.L. Angert, *S.L. Gatton, *M.T. Reilly, and R.G. Landolt, The Role of Substituents and pH in Activating Hypochlorite Oxidations of Coal Models, FUEL, 56, 224 (1977).

*B.A. Della Coletta, *J.G. Frye, *T.L. Youngless, *J.P. Zeigler, and R.G. Landolt, Kinetics of the Interaction of Nitrosobenzenes with Substituted Benzaldehyde Phenylhydrazones, J. Org. Chem., 42, 3057 (1977).

Current Research Grant: $4,300 from Research Corporation to study hypohalite oxidations of aromatic compounds.

NIEMAN, GEORGE C. (b.1938) Professor. B.S., 1961, Carnegie-Mellon University, Ph.D., 1965, California Institute of Technology. Physical Chemistry. Molecular spectroscopy.

G.C. Nieman and S.D. Colson, A New Electronic State of Ammonia Observed by Multiphoton Ionization, J. Phys. Chem., 68, 5656 (1978).

G.C. Nieman and S.D. Colson, Pressure Effects on the Two-photon Spectrum of trans-Butadiene as Detected by Gas Phase Transient Lensing Spectroscopy, J.Chem. Phys., 68, 2994 (1978).

WALLACE, WILLIAM J. (b.1935) Professor. B.S., 1956, Carson-Newman College, Ph.D., 1960, Purdue University. Inorganic Chemistry. The interaction of diborane with metal borohydrides and boraneamines.

J.D. Black, M.J. Boylan, P.S. Braterman, W.J. Wallace, Photochemistry of Fe $(CO)_3[P(p\text{-}C_6H_4CH_3)_3]_2$ and $W(CO)_4[P(i\text{-}C_3H_7)_3]_2$ and the apparently anamalous behavior of $(cyclo\text{-}C_4H_4)Fe\ (CO)_3$, J. Organometallic Chem., 63, 21 (1973).

NEWBERRY COLLEGE

Newberry, SC 29108

Fall 1978 ug enrollment 800

Degrees offered A.B. and B.S.

Telephone (803) 276-5010, ext. 238

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2.Support staff: FTE's secretary ½ Stockrm ½ Technician 0
3. 1978 seniors & their placement: Total 7 Grad. school 2 Industry 3 Professional schools 2 Other ______.
4. Senior majors, average past five years: 5 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

   None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 14,000 % used for teaching 65 Research 35
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

   NMR (Varian EM 300X)
   GC (P-E 990)
   IR (P-E 700)
   UV-VIS (P-E 124)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? no Total journal subscriptions? 12 Computer literature search service? No Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 1 .
4. Computer facilities: Digital Corporation PDP11/50 - DECscopes and DECwriters.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approximately $500/year Chemicals and glassware; $500/year.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 20 Load credit for research? 6-one faculty
4. Sabbatical or leave support for research:
   None

BEAM, CHARLES F. (b. 1940) Associate Professor and Director of Scientific Research, B.S.., 1963, The City College of the City University of New York, Ph.D., 1970, University of Maryland. Postdoctoral Research Associate, 1968-71, Duke University; 1972-72, Lehigh University. Organic and Polymer Chemistry. Strong-base synthesis, monomer and polymer syntheses, medicinal syntheses, and pyrolysis studies.

Twenty-one publications, 1973-1978.

*R.W. Hall, *F.C. Bernhardt, and C.F. Beam, bis-Isatoic Anhydrides I. The Preparation of bis-Isatoic Anhydrides, J. Heterocycl. Chem., 15, 495 (1978).

*S.E. Davis, *L.M. Shaffer, *N.L. Shealy, *K.D. Shealy, and C.F. Beam, The Preparation and Reactions of Anions of Certain Schiff Bases, Syn. Commun., 7, 261 (1977).

*S.E. Davis, *N.L. Shealy, *K.D. Shealy, *L.M. Shaffer, and C.F. Beam, Aldol-Type Condensations of C(α)-Dianions of Azines, Can.J. Chem., 56, 1236 (1978).

C.F. Beam, *R.M. Sandifer, R.S. Foote, and C.R. Hauser, Monoalkylation and Aldol Condensations at the α-Carbon Atom of Ketones, Chem. and Indust., 487 (1976).

C.F. Beam, *D.C. Reames, *C.E. Harris, *L.W. Dasher, *W.M. Hollinger, *N.L. Shealy, *R.M. Sandifer, *M. Perkins, and C.R. Hauser, A New Method for the Preparation of 4-Acylpyrazoles. The Reaction of C(α),N-Dianions of Phenylhydrazones with Acid Chlorides, J. Org. Chem., 40, 514 (1975).

Grants Active, 1977-78: PRF, type B, $11,000, The Preparation and Preliminary Characterization of Polymers from Bis-Isatoic and Isatoic Anhydrides. Research Corporation, Cottrell College Science, $5,810. S. Carolina Heart Association, $3,920.

JEREMIAS, CHARLES G. (b. 1920) Professor, B.S., 1942, University of Georgia, Ph.D. 1949, Tulane University. Organic Chemistry. Preparation of insecticides.

PARK, CONRAD B. (b. 1919) Professor, B.S.., 1941, Newberry College, M.A., 1943, and Ph.D., 1952, University of North Carolina at Chapel Hill. Physical and Inorganic Chemistry. Surface-active agents.

OBERLIN COLLEGE
Oberlin, OH 44074

Fall 1978 ug enrollment 2700
Degrees offered B.A., M.A.
Telephone (216) 775-8300

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 25 Grad. school 12 Industry ____ Professional schools 4 Other 9 .
4. Senior majors, average past five years: 24 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

NSF Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 24,100 % used for teaching 75 Research 25
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

Laser Raman Spectrometer (Spex, Ramalog; Coherent Radiation, CR-5)
M.S.(Nuclide Analysis Associates)
M.S.-G.C.(Hitachi; RMS-4; PE,881)
UV-Vis-IR Spectrometer (Cary 17)
IR Spectrometer (PE-621)
UV-Vis, 3.5M Grating Spectrograph (B and L)
NMR (PE,R12B)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 47 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 8 .

4. Computer facilities: Xerox Sigma 9 model 2 central processing unit.
50 time-sharing terminals (2 in the Chemistry Department)
TRS-80 Micro computer system (dedicated)

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: N/A

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

DuPont

3. Faculty teaching loads: Contact hours 10 Load credit for research? No
4. Sabbatical or leave support for research: Sabbatical leave: Normally every 7th yr. but may be earlier. Full salary for 1 sem. or ½ salary for full yr. Research status appointment: Usually 4-8 awards/yr. Applications may be made at any time. Full salary plus additional supplementary stipend for one year.

FACULTY PROFILE

ACKERMANN, MARTIN N. (b. 1941) Professor. B.S., 1963, Carnegie Institute of Technology, Ph.D., 1966, University of California, Berkeley. *Inorganic Chemistry*. Organometallic synthesis; transition metal carbonyl complexes of diazenes (azo compounds); properties of diazenes.

Fifteen publications, 1973-1978.

N. C. Craig, M. N. Ackermann, and *R. A. MacPhail, Vibrational Spectra for *trans*-Dimethyldiazene-1,1,1-d_3 (Azomethane). Potential Functions for *trans*-Dimethyldiazene and *trans*-Methyldiazene, *J. Chem. Phys.*, *68*, 236 (1978).

M. N. Ackermann, L.-J. Kou, *J. M. Richter, and *R. M. Willett, Cyclopentadienylironcarbonyl Complexes of Cyclic Cis Azo Ligands. Diiron Bridging and Cationic Monometallic Compounds, *Inorg. Chem.*, *16*, 1298 (1977).

M. N. Ackermann, N. C. Craig, *R. R. Isberg, *D. M. Lauter, *R. A. MacPhail, and *W. G. Young, *cis*-Dimethyldiazene, *J. Amer. Chem. Soc.*, *99*, 1661 (1977).

M. N. Ackermann, *D. B. Shewitz, and *C. R. Barton, Tungstenpentacarbonyl Complexes of *cis*- and *trans*-Azoisopropane. Azo Ligand Geometry Effects on the Formation and Properties of Organometallic Complexes, *J. Organometal. Chem.*, *125*, C33 (1977).

M. N. Ackermann, *W. E. Steinmetz, and *D. H. Robison, Kinetics of the Alkaline Hydrolysis of Hydroxylamine-O-sulfonic Acid and Its Reactions with Hydrazine and Hydroxylamine, *Inorg. Chem.*, *14*, 421 (1975).

Grants active 1977-1978: Petroleum Research Fund, Type B, $11,000, Metal Carbonyl Complexes of Azo Ligands.

CARLTON, TERRY S. (b. 1939) Professor. B.S., 1960, Duke University, Ph.D., 1963, University of California, Berkeley. *Theoretical Chemistry*. Electron correlation.

T. S. Carlton, *J. A. Morrell, and *D. M. Arnow, Exponential or Scaled SCF Orbitals in Correlated Wavefunctions for Two-Electrons Atoms, *J. Chem. Phys.*, *58*, 4092 (1973).

T. S. Carlton, An Alternative Expression for Hulthén Orbitals, *J. Chem. Phys.*, *59*, 6687 (1973).

N. C. Craig, T. S. Carlton, and R. C. Schoonmaker, Flame Temperature: A Physical Chemistry Experiment, *J. Chem. Educ.*, *51*, 54 (1974).

T. S. Carlton, Quantum Mechanical Demonstrations with Polarized Light, *Am. J. Phys.*, *42*, 408 (1974).

R. F. Nalewajski and T. S. Carlton, The Reference Coordinate Approach for Determining the Minimum Energy Reaction Path, *Acta Phys. Pol. A*, *53*, 321 (1978).

CRAIG, NORMAN C. (b. 1931) Professor. B.A., 1953, Oberlin College, Ph.D., 1957, Harvard University. *Physical Chemistry*. Vibration spectroscopy and normal coordinate analysis of small molecules.

Six publications, 1973-1978.

N. C. Craig, M. N. Ackermann, and *R. A. MacPhail, Vibrational Spectra for *trans*-Dimethyldiazene-1,1,1-d_3(Azomethane). Potential Functions for *trans*-Dimethyldiazene and *trans*-Methyldiazene, *J. Chem. Phys*., *68*, 236 (1978).

N. C. Craig, *R. A. MacPhail, and *D. A. Spiegel, Vibration Assignments and a Potential Function for 3,3-Difluorocyclopropene-d_0,-d_1, and d_2, *J. Phys. Chem*., *82*, 1056 (1978).

K. R. Ramaprasan, V. W. Laurie, and N. C. Craig, Microwave Spectrum, Structure, and Dipole Moment of 3,3-Difluorocyclopropane, *J. Chem. Phys*., *64*, 4832 (1976).

N. C. Craig, *T.-N. Hu Chao, *E. Cueller, *D. E. Hendriksen, and *J. W. Koepke, Vibrational Spectra and Assignments for *cis*- and *trans*-1,2-Difluorocyclopropane and Three Deuterium Substituted Modifications of Each Isomer, *J. Phys. Chem*., *79*, 2270 (1975).

N. C. Craig, *J. Kemeny Alpern, and *K. M. Parkin, Infrared and Raman Spectra of 1H-Trifluorocyclopropene -d_0 and d_1, *Spectrochimica Acta*, *31A*, 1463 (1975).

Grants active 1977-1979: Petroleum Research Fund Grant, $11,000, Vibrational Spectroscopy of Fluorinated C_3 Ring Systems. Research Corporation Grant, $12,000, Vibrational Spectroscopy of Small Diazene Molecules.

FUCHSMAN, WILLIAM H. (b. 1941) Associate Professor. B.A., 1963, Harvard University, Ph.D., 1967, The Johns Hopkins University. *Biochemistry*. Bioinorganic chemistry of hemeproteins, nitrogen fixation; chemistry of phophyrins and metalloporphyrins.

Seven publications, 1973-1978.

W. H. Fuchsman, *Q. R. Smith, and *M. M. Stein, Direct Raman Evidence for Resonance Interactions between the Porphyrin Ring System and Ring-Conjugated Substituents in Porphyrins, Porphyrin Dications and Metalloporphyrins, *J. Amer. Chem. Soc*., *99*, 4190. (1977).

W. H. Fuchsman, *C. R. Barton, *M. M. Stein, *J. T. Thompson, and *R. M. Willett, Leghemoglobin: Different Roles for Different Components?, *Biochem. Biophys. Res. Commun*., *68*, 387 (1976).

W. H. Fuchsman, S.-H. Weng, and W. S. Caughey, An Infrared Probe of Iron Porphyrin Oxidation State and Axial Ligation, *Bioinorg. Chem*., *4*, 353 (1975).

W. H. Fuchsman, *H. H. Bernstein, and *D. P. Tempest, Porphyrin Basicity Effects upon the Reactivity of μ-Oxo-bis[porphinatoiron(III)] Compounds. Reaction with Acetic Acid, *Bioinorg. Chem*., *4*, 177 (1975).

W. H. Fuchsman, C. H. Barlow, W. J. Wallace, and W. S. Caughey, Novel Heme:O_2 Bonding of Possible Relevance to Oxygen Utilizing Heme and Other Proteins, *Biochem. Biophys. Res. Commun*., *61*, 635 (1974).

Grants active: Research Corporation (Cottrell), $7800, Axial Ligand Sensitivity of Iron Porphyrin Vibrations.

HAWKINS, PETER J. (b. 1922) Professor. B.Sc. (London), 1945, Ph.D. (London), 1950. *Organic Chemistry*. Synthesis.

SCHOONMAKER, RICHARD C. (b.1930) Professor. B.Ch.E., 1952, Yale University, Ph.D., 1960, Cornell University. Physical Chemistry. High temperature chemistry, gas-surface interactions, structure and properties of surfaces, molecular beam scattering from surfaces.

Nine publications, 1973-1978.

A. P. Janssen and R. C. Schoonmaker, An Auger and Reflection Electron Diffraction Investigation of Oxygen and Hydrogen Adsorption on Strontium Surfaces, Surf. Sci., 55, 109 (1976).

*Paul O'Connor and Richard Schoonmaker, Desorption and Diffusion of Sodium Chloride Molecules Adsorbed on a Sodium Chloride (100) Crystal Surface, J. Phys. Chem., 80, 390 (1976).

A. P. Janssen, R. C. Schoonmaker, and A. Chambers, A Study of the Epitaxial Growth of Magnesium on Magnesium Oxide (001) using Reflection Diffraction, LEED, and Auger Spectroscopy, Surf. Sci., 49, 143 (1975).

R. C. Schoonmaker and *L. C. Tu, Mechanism of Condensation II. Condensation of Molecular Beams of Sodium Chloride on Clean and Contaminated Surfaces of Oriented Single Crystals of NaCl, J. Chem. Phys., 60, 4650 (1974).

R. C. Schoonmaker and *V. Lo, Mechanism of Condensation I. Direct Determination of Coefficients for Condensation of Molecular Beams of Sodium Chloride on (100) Oriented Single Crystals of NaCl, J. Chem. Phys., 58, 727 (1973).

Grant active 1978-1980: Petroleum Research Fund Grant, $13,000, The Mechanism of Condensation, Scattering of Molecular Beams by Surfaces.

SMITH, LEVERETT R. (b.1949) Assistant Professor. B.A., 1970, University of California at Santa Cruz, Ph.D., 1976, Cornell University. Organic Chemistry. Reactions of possible preparative use; chemical ecology.

Six publications, 1973-1978.

G. E. Gream, L. R. Smith, and J. Meinwald, A New $(CH)_8$ Isomer, Tetracyclo $[4.2.0.0^{2,4}.0^{3,5}]$oct-7-ene, J. Org. Chem., 39, 3461 (1974).

L. R. Smith and J. Meinwald, The Wolff Rearrangement Approach to the Tricyclo$[3.2.0.0^{2,6}]$heptane System, J. Org. Chem., 42, 415 (1977).

L. R. Smith, G. E. Gream, and J. Meinwald, Synthesis and Reactions of Tetracyclo$[4.2.0.0^{2,4}.0^{3,5}]$octanes, J. Org. Chem., 42, 927 (1977).

U. Ravid, R. M. Silverstein, and L. R. Smith, Synthesis of the Enantiomers of 4-Substituted γ-Lactones with Known Absolute Configuration, Tetrahedron, 34, 1449 (1978).

L. R. Smith, H. J. Williams, and R. M. Silverstein, Facile Synthesis of Optically Active 2-Ethyl-1,6-dioxaspiro[4.4]nonane, Component of the Aggregation Pheromone of the Beetle Pityogenes chalcographus(L.), Tetrahedron Lett., 3231 (1978).

ST. JOHN, WILLARD M. (b.1947) Assistant Professor. B.A., 1969, Rice University, Ph.D., 1974, Johns Hopkins University. Physical Chemistry. Electron scattering spectroscopy.

Five publications, 1973-1978.

W. M. St. John, R. C. Esther, and J. P. Doering, Low Energy Electron Impact Study of Acetone, J. Chem. Phys., 61, 763 (1974).

R. A. Bonham, J. S. Lee, R. E. Kennedy, and W. M. St. John, Experimental Measurements of Charge and Momentum Densities, Generalized Oscillation Strengths, and Excitation Frequencies, Advances in Quantum Chemistry, v. 11, p. 1, Academic Press, N.Y., 1978.

OCCIDENTAL COLLEGE

Los Angeles, CA 90041

Fall 1978 ug enrollment 1648

Degrees offered B.A.

Telephone (213) 259-2761

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6-1/2 2. Support staff: FTE's secretary 1/4 Stockrm 1 Technician 1/2
3. 1978 seniors & their placement: Total 21 Grad. school 9 Industry 9 Professional schools 2 Other 1.
4. Senior majors, average past five years: 22.
5. Students involved in research, average past five years: Acad. yr. 15 Summer 14
6. National student honors, past five years (NSF fellowships, etc.)

1978 Eric Stelter, Danforth Fellowship Finalist
1976 Ann Hagerman, NSF Fellowship; David Morgan NSF Fellowship (honorable mention)
1973-75 A number of students were given honorable mention for NSF Fellowships.

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 11,700 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Jeolco C-60 HL with var. temp. probe)
MS (Varian EM-600 with direct probe, Bendix MA-3)
UV-Vis (GCA/McPherson EU-721D)
IR (P-E 397, 237)
AA (2 P-E 290B, Graphite Furnace HGA-2100)
DTA, TGA, DSC (duPont 900-950)
GC (2 H-P 5700A, 8 others)
HPLC (ARL 750 with dual detectors)
Electrochem. (PAR-174, Beckman 30)
Liq. Scint. (Beckman LS-100C)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 53 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 26.

4. Computer facilities: Department; minicomputer, Data General Nova 1200, Pertic 5MA, complete with instrument interfacing, Tektronix 4010 Graphics Terminal. Campus: IBM 370/25

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $1000/yr. chemicals and glassware; $4,000/yr. for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

DuPont College Science Grant, $6,500
NSF-URP, $14,670
Shell College Grant to Chemistry, $500

3. Faculty teaching loads: Contact hours 11 Load credit for research? No

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at full salary for 1/3 year (one term), or 1/3 salary full year every fifth year.

FACULTY PROFILE

AMEY, Ralph L. (b. 1937) Associate Professor. A.B., 1959, Pomona College, Ph.D., 1964, Brown University. Physical Chemistry. Thermodynamic properties of solutions.

R.L. Amey, The Apparent Quadrupole Moments of Carbon Monoxide and Nitrogen and Their Vibrational Motion in the Liquid State, J. Phys. Chem., 78, 1968 (1974).

CLELAND, George H. (b. 1921) Professor. A.B., 1942, Occidental College, Ph.D., 1951, California Institute of Technology. Organic Chemistry. Synthesis of novel amino acids and the mechanism of the Meerwein reaction.

G.H. Cleland, The Synthesis of o-Chlorocinnamic Acid via the Meerwein Reaction, J. Chem. Educ., 55 (1978).

COVEY, William D. (b. 1940) Assistant Professor. B.S., 1962, University of California, Berkeley, M.S., 1970, Sacramento State College, Ph.D., 1973, University of Illinois. Physical Inorganic Chemistry. Kinetic studies of substitution in metal carbonyl complexes; Polymer studies.

F.P. De Haan, W.D. Covey,*M.S. Anisman,*R.L. Ezelle,*J.E. Margetan, *K.D. Miller,*S.A. Pace,*S.L. Pilmer,*M.J. Sollenberger and*D.S. Wolf, A Kinetic Study of the Friedel-Crafts Benzylation Reaction in Excess Aromatic and in Nitromethane, J. Amer. Chem. Soc., 100, 5944 (1978).

*B.J. Carter, W.D. Covey and F.P. De Haan, A Kinetic Study of Friedel-Crafts Ethylation Reaction in Nonpolar Solvent, J. Amer. Chem. Soc., 97, 4783 (1975).

W.D. Covey and D.L. Leussing, A Kinetic Study of the Zn(II) Promoted Decarboxylation of Oxalacetic Acid, J. Amer. Chem. Soc., 96, 3860 (1974).

W.D. Covey and D.L. Leussing, Enolization Rates of Zn(II)-oxalacetate Complexes, Chem. Commun., 1, 31 (1974).

W.D. Covey and T.L. Brown, A Kinetic Study of Amine Substitution in $Mo(CO)_5$(amine) Complexes, Inorg. Chem., 12, 2820 (1973).

Grants active 1977-78: Research Society of America, $100, Investigation of Solvent Effects on Amine Substitution in $Mo(CO)_5$(amine).

DE HAAN, Frank P. (b. 1934) Professor. A.B., 1957, Calvin College, Ph.D., 1961, Purdue University. Physical Inorganic Chemistry. Mechanisms of Electrophilic aromatic substitution reactions.

F.P. De Haan, W.D. Covey,*M.S. Anisman,*R.L. Ezelle,*J.E. Margetan, * K.D. Miller,*S.A. Pace,*S.L. Pilmer,*M.J. Sollenberger and*D.S. Wolf, A Kinetic Study of the Friedel-Crafts Benzylation Reaction in Excess Aromatic and in Nitromethane, J. Amer. Chem. Soc., 100, 5944 (1978).

*B.J. Carter, W.D. Covey and F.P. De Haan, A Kinetic Study of Friedel-Crafts Ethylation Reaction in Nonpolar Solvent, J. Amer. Chem. Soc., 97, 4783 (1975).

Grants active 1977-1978: National Science Foundation, $40,000 Mechanisms of Electrophilic Aromatic Substitution Reactions.

LAMBERT, Frank L. (b. 1918) Professor. A.B., 1939, Harvard University, Ph.D., 1942, University of Chicago. Organic Chemistry. Electrochemistry of organic halogen compounds.

F.L. Lambert,*B.L. Hasslinger,*R.N. Franz III, The Total Reduction of Carbon Tetrachloride at the Glassy Carbon Electrode, J. Electrochem. Soc., 122, 737 (1975).

F.L. Lambert,*G.B. Ingall, The Reduction of Organic Chlorides at the Vitreous (Glassy) Carbon Electrode, Tetrahedron Letters, 3231 (1974).

MCANALLY, John S. (b. 1918) Professor. B.S., 1938, M.A., 1940, Ph.D., 1950, Indiana University. Biochemistry. Analysis of pollutants in Los Angeles estuarial sediments.

WEST, C. David (b. 1937) Associate Professor. A.B., 1959, Pomona College, Ph.D., 1964, Massachusetts Institute of Technology. Analytical Chemistry. Atomic emission and absorption spectrophotometry, fluorescence and luminescence and automation of chemical instrumentation.

C.D. West, H.G.C. Human, R.H. Scott, A.R. Oakkes, The Use of a Spark as a Sampling-Nebulizing Device for Solid Samples in Atomic Absorption, Atomic Fluorescence and Inductively-Coupled Plasma Emission Spectrometry, Analyst, 101, 265 (1976).

C.D. West, H.G.C. Human, Self-Absorption and Doppler Temperatures of Emission Lines Excited in a Glow Discharge Lamp, Spectrochim. Acta, 31B, 81 (1976).

Grants active 1977-1978: Research Corporation Cottrell College Science Grant, $10,000, Development of Abnormal Glow Discharge System for Solids Analysis by Mass Spectroscopy.

OHIO NORTHERN UNIVERSITY

Ada, OH 45810

Fall 1978 ug enrollment 2131

Degrees offered B.A.

Telephone (419) 634-9921

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2. Support staff: FTE's secretary 1/2 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 12 Grad. school 3 Industry 4 Professional schools 4 Other 1 .
4. Senior majors, average past five years: 6 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

   None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 32,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR (Varian EM 360)
   UV-Vis (Beckman DU; Perkin-Elmer 202)
   IR (Perkin Elmer 337)
   Gouy Balance
   Dipolmeter (DM 01)
   GC (2 Hewlet-Packard 5750; 1 Perkin-Elmer 820)
   GC (Varian Series 1400-Prep.)
   X-ray D (Beckman-Toshibe ADG-301)
   Spinng Band Dist. C. (BHR-36)
   Fluorimeter (Hitachi-Perkin-Elmer-204)
   Polarimeter (Rudolph Research DP 06)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 31 Computer literature search service? No Separate chemistry or science library? No Librarian? Yes Standing orders for review series and annual reviews (past five years) 33 .

4. Computer facilities:

   Campus (on same floor as chemistry department); DEC PDP 11/70

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   Approx. $4,000/yr. chemicals and glassware; Approx. $4,000/yr. for equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   None presently active.

3. Faculty teaching loads: Contact hours 14 Load credit for research? occasional

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for one quarter. Frequency average every 7th year.

BETTINGER, DONALD J. (b. 1927) Professor. B.S., 1947, Miami (Ohio) University, M.S., 1950, University of Cincinnati, Ph.D., 1955, University of North Carolina. Inorganic Chemistry. Transition element chemistry. Instructional Innovations In Chemical Education.

D. J. Bettinger and H. L. Haight, A Pre-Introductory College Chemistry Refresher Course, J. Chem. Educ., 54, 729 (1977).

HAIGHT, HOWARD L. (b. 1929) Professor. B.S., 1952, M.S., 1957, University of Nebraska, Ph.D., 1963, University of Iowa. Inorganic Chemistry. Preparation and properties of metal olefin compounds. Structures of metal olefin compounds. Instruction innovation in general chemistry.

D. J. Bettinger and H. L. Haight, A Pre-Introductory College Chemistry Refresher Course, J. Chem. Educ., 54, 729 (1977).

HAWBECKER, BYRON L. (b. 1935) Professor and Chairman. B.A., 1957, Manchester College, M.S., 1962, University of Arizona, Ph.D., 1968, Kent State University. Organic Chemistry. Kinetic - mechanistic studies of molecular rearrangements involving electron deficient nitrogen. Synthesis of organic nitrogen compounds. Development of teaching models for chemical laboratory.

Three publications, 1973-1978.

B. L. Hawbecker, *D. A. Radovich, and *L. G. Tillotson, Preparation of Phenanthridone: A Multipurpose Experiment For The Organic Laboratory, J. Chem. Educ., 53, 398 (1976).

B. L. Hawbecker, D. W. Kurtz, T. D. Putnam, *P. A. Ahlers, and *G. D. Gerber, The Aldol Condensation: A Simple Teaching Model For The Organic Laboratory, J. Chem. Educ., 55, 540 (1978).

HOLMES, BERT E. (b. 1948) Assistant Professor. B.S. and B.A., 1970, The College of Emporia, Ph.D., 1976, Kansas State University. Physical Chemistry. Kinetic studies of unimolecular gas-phase reactions.

Five publications, 1973-1978.

K. D. Kim, D. W. Setser and B. E. Holmes, Hydrogen Fluoride and Deuterium Fluoride Elimination Reactions of Chemically Activated 1,1,1-Trideuterio-2,2-difluoroethane; 1,1-Difluoroethane; and 1,1,1-Trideuterio-2-fluoroethane, J. Phys. Chem., 77, 725 (1973).

B. E. Holmes and D. W. Setser, Energy Disposal In Unimolecular Reactions. Four-Centered Elimination of HCl, J. Phys. Chem., 79, 1320 (1975).

B. E. Holmes, D. W. Setser and G. O. Pritchard, Energy Disposal in the Three-Centered Elimination of DF from 1,1,2-Trifluoroethane-1-d_1, Int. J. Chem. Kinetics, 8, 215 (1976).

B. E. Holmes and D. W. Setser, Unimolecular Rate Constants for Ring Rupture and HCl Elimination from Chemically Activated 1-, 2-, and 3-Methylchlorocyclobutane and Chloromethylcyclobutane, J. Phys. Chem., 82(22) XXXX (1978).

B. E. Holmes and D. W. Setser, Energy Disposal by the Four-Centered Unimolecular Hydrogen Chloride Elimination Reaction, J. Phys. Chem., 82(22) XXXX (1978).

HRUSCHKA, JUDITH K. (b. 1943) Instructor. B.A., 1964, Manchester College, M.A., 1966, Harvard University. *Biochemistry*.

A. Kelman and J. Hruschka, The Role of Motility and Aerotaxis in the Selective Increase of Avirulent Bacteria in Still Broth Cultures of *Pseudomonas solanacearum*, *J. Gen. Microbiology*, *76*, 177 (1973).

KURTZ, DAVID W. (b. 1942) Associate Professor. B.S., 1964, Houghton College, Ph.D., 1972, Syracuse University. *Organic Chemistry*. Organic photochemistry. Rearrangements and pericyclie reactions.

Four publications, 1973-1978.

R. C. Hahn, and D. W. Kurtz, Photochemistry of 4-Cyclopropyl-4-phenylcyclohexenone, *J. Amer. Chem. Soc.*, *95*, 6723 (1973).

H. E. Zimmerman, P. Baectstrom, T. Johnson, and D. W. Kurtz, Stereochemistry of the Di-Pi-Methane Rearrangement at Carbon-1, *J. Amer. Chem. Soc.*, *96*, 1459, (1974).

B. L. Hawbecker, D. W. Kurtz, T. D. Putnam, and *P. A. Ahlers, and *G. D. Gerber, The Aldol Condensation: A Simple Teaching Model For the Organic Laboratory, *J. Chem. Educ.*, *55*, 540 (1978).

LAMB, ROBERT E. (b. 1945) Assistant Professor. B.A., 1969, B.S., 1970, Saint Louis University, M.S., 1974, Ph.D., 1975, University of Illinois. *Analytical Chemistry*. Ion selective electrodes. Pulse-modulated voltammetry. Determination of metals in biological and environmental samples.

Three publications, 1973-1978.

R. E. Lamb, D. F. S. Natusch, J. E. O'Reilly, and N. Watkins, Laboratory Experiments with Ion Selective Electrodes, *J. Chem. Educ.*, *50*, 432 (1973).

D. F. S. Natusch, R. M. Davison, R. E. Lamb, J. R. Wallace, and C. A. Evans, Trace Metals in Airborne Particles, *Proc. 3rd Int. Clean Air Congress*, C12 (1973).

R. S. Sohal and R. E. Lamb, Intracelluar Deposition of Metals in The Midgut of The Adult Housefly, *Musca Domestica*, *J. Insect Physiol.*, *23*, 1349 (1977).

WILHELM, DALE L. (b. 1926) Professor. B. S., 1951, University of Illinois, M.S., 1952, Ph.D., 1954, University of Tennessee. *Inorganic Chemistry*. Heteropolyanions. Electrophoresis of inorganic ions.

D. L. Wilhelm, The Law of Definite Proportions, *J. Chem. Educ.*, *50*, 436 (1973).

D. L. Wilhelm, The Challenge to Scientists' Values, *Register of Phi Lambda Upsilon*, *63*, No. 1, 11 (1978).

OHIO WESLEYAN UNIVERSITY
Delaware, OH 43015

Fall 1978 ug enrollment 230
Degrees offered BA
Telephone (614) 369-4431

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 9 Grad. school 3 Industry 0 Professional schools 4 Other 2 .
4. Senior majors, average past five years: 12 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)
   NSF fellowship - 1978

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 30,000 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)
   NMR: Varian T-60 with low temp. probe
   Vis-UV: Bausch and Lamb 505, Beckman DU and DB
   IR: Beckman Model 10 and Acculab 2
   MS: Consolidated Electrodynamics Model 620
   EM: Hitachi Scanning and transmission Scopes
   AA: Varian Techtron 120
   GLC: Aerograph A90P3, thermal cond. Mictrotech GC1600,H_2 flame & EC
   Electrochem: PAR 174,175 polaragraphic Analyzer
   Gouy Balance
   Parr bomb calorimeter
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 32 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 15 .
4. Computer facilities: University: PDP 11/70 system with 30 terminals (hard copy + CRT) + 4 graphics terminals. In process of purchasing minicomputer for instrument interfacing.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approximately $5000/yr for chemicals and glassware
   $3-5000/yr instrumentation
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   NSF-ISEP $6000
3. Faculty teaching loads: Contact hours 11-13 Load credit for research? no
4. Sabbatical or leave support for research:
   Automatic 1 term (quarter) leave every four years, full pay.

KLEUPPEL, ANTHONY W. (b. 1944) Visiting Assistant Professor, B.S., 1966, Illinois, Benedictine College, Ph.D., 1971, The Ohio State University, Organic Chemistry. Solvent and substituent effects on rates of reaction; bioorganic redox reactions, organic electrochemistry.

Jack Hine and Anthony W. Kleuppel, Structural Effects on Rates and Equilibria XVIII. Thermodynamic Stability of Ortho Esters. J. Am. Chem. Soc., 96, 2924(1974).

MCQUIGG, ROBERT D. (b. 1936) Professor and Chairman, B.S., 1958 Muskingum College, Ph.D. 1964, The Ohio State University, Physical Chemistry. Photochemical kinetics of atmospheric pollutants; computer modeling of kinetic and smog chamber mechanism: photochemistry of coordination compounds; environmental science.

C.S. Kan, R.D. McQuigg, M.R.Witbeck, and J.G. Calvert, A Kinetic Flash Spectroscopic Study of the CH_3O_2-CH_3O_2 and CH_3O_2 and CH_3O_2-SO_2 Reactions, Intern. J. of Chem. Kinetics, in press, (1978).

R.D. McQuigg, J. G. Calvert, The Computer Simulation of the Rates and Mechanisms of Photochemical Smog Formation, Intern. J. of Chem. Kinetics, Symp. 1, 113-154(1975).

R.D. McQuigg, E. Allen, R. Cadle, The Photooxidation of Gaseous Sulfur Dioxide in Air, Chemosphere 1, 25-32(1973).

MEEK, VIOLET IMOF (b. 1939) Associate Professor. B.A., 1960, St. Olaf College, M.A., 1962, and Ph.D., 1964, University of Illinois. Inorganic Chemistry. Syntheses of inorganic coordination compounds, determination of the structure of coordination compounds by physical methods.

MILLER, THEODORE L., (b. 1940) Assistant Professor, B.S., 1966, Concord College, M.S., 1970, Marshall University, Ph.D. , 1974, University of Cincinnati, Physical Chemistry. Luminescence spectroscopy, metal ions in biological systems, crocetin in atherosclerosis, and on-line computerized instrumentation.

Seven publications, 1973-78.

T.L. Miller, and R. Marshall Wilson, Computerized Kinetic Luminescence Spectroscopy: Time-Resolved and Component-Resolved Phosphorescence Spectroscopy, Anal. Chem., 47(2), 256(1975).

D.J. Nelson, T.L. Miller, and R.B. Martin, Non-Cooperative Calcium (II) Removal and Terbium (III) Substitution in Carp Muscle Calcium Binding Parvalbumin, Bioinorg. Chem., 7, 325(1977).

Theodore L. Miller, Chemistry for Nonscience Students, J. Chem. Educ., 54, 502, (1977).

Theodore L. Miller and J. DiPaolantonio II, An Inexpensive Voltaic Cell, J. Chem. Educ., 55, 50(1978).

WICK, LAWRENCE B. (b. 1917) Professor, B.S., 1940, M.S., 1943, and Ph.D., 1948, University of Michigan. Organic Chemistry. Synthesis and mechanisms in organic chemistry, organo-phosphorus compounds.

WILSON, LAUREN R. (b. 1936), Professor and Dean of Academic Affairs. B.S., 1958, Baker University, Ph.D., 1963, The University of Kansas, Inorganic and Environmental Chemistry. Electrocatalysis at chemically modified electrode surfaces, coordination chemistry of metal ions of biological importance.

PACIFIC LUTHERAN UNIVERSITY
Tacoma, WA 98447

Fall 1978 ug enrollment 2150
Degrees offered B.A., B.S.
Telephone (206) 531-6900

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 1/2 2. Support staff: FTE's secretary 1/3 Stockrm 1 Technician 1/3
3. 1978 seniors & their placement: Total 16 Grad. school 5 Industry 6 Professional schools 2 Other 3.
4. Senior majors, average past five years: 18.
5. Students involved in research, average past five years: Acad. yr. 10 Summer 1-2
6. National student honors, past five years (NSF fellowships, etc.)
   One NSF fellowship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 7800 % used for teaching 84% Research 16%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

LC (Waters pump, P-E 55 detector)
NMR (Varian EM-360)
IR (P-E 457)
UV-vis (Cary 219)
GC (Packard 417)

AA (Inst. Labs.)
EPR (Varian E-3)
Liq. Scint. (Nuc.Chi.Unilux IIA)
X-ray diff. (GE XRD-5)
Dipolmeter (Weilheim D 812)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? thru' 8th Total journal subscriptions? 45 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 13.
4. Computer facilities: Campus: Univac 70/46; Department: IMSAI-8080 microprocessor

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: None specifically budgeted. An estimated $1500-2000 is utilized from general departmental accounts.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   None
3. Faculty teaching loads: Contact hours 14 1/2 Load credit for research? No
4. Sabbatical or leave support for research: Eligible every seven years for sabbatical at 50% salary full year or 100% salary for half year. Frequency averages every 12th year.

FACULTY PROFILE

ANDERSON, CHARLES D. (b. 1930) Professor and Chairman. B.A., 1952, St. Olaf College; A.M., 1954, Ph.D., 1959, Harvard University. Organic Chemistry. Protecting groups; photochemistry of acetals; methylene bis-pyridinium compounds.

APRILE, JOSEPH A. (b. 1944) Instructor. B.S., 1966, Manhattan College; M.S., 1970, North Carolina State University. Separation and purification of nervous tissue proteins.

CARLSON, ROBERT E. (B. 1944) Assistant Professor. B.A., 1966, Gustavus Adolphus College; Ph.D., 1971, University of Iowa. Physical Chemistry. Infrared spectroscopy, molecular structure.

R.D. Cooke, C. Pastorek, R.E. Carlson, and J.C. Decius, "Infrared Relection of $NaHF_2$ and KHF_2 and the Dipole Derivatives of the HF_2^- Ion", J. Chem. Phys., 69, 5(1978).

F. Meserole, J.C. Decius, and R.E. Carlson, "Vibrational Spectra of Internal Modes of Oriented Single Crystal Potassium Sulfate", Spectrochim. Acta, 30A, 2179 (1974).

R.E. Carlson and J.C. Decius, "Infrared Reflection From the Internal Mode of Crystalline Lithium Hydroxide", J. Chem. Phys., 60, 1251 (1974).

GIDDINGS, WILLIAM P. (b. 1933) Professor. B.A., 1954, DePauw University, M.A., 1956, Ph.D., 1959, Harvard University. Organic Chemistry; Environmental Chemistry. Nature of carbonium ion intermediates in organic solvolysis reactions; organic compounds in the atmosphere.

W.P. Giddings and M.B. Baker, "Sources and Effects of Monolayers on Atmospheric Water Droplets", J. Atmospheric Sciences, 34, 1957-64 (1977).

HUESTIS, LAURENCE D. (b. 1934) Professor. B.S., 1956, University of California, Berkeley; Ph.D., 1960, University of California, Davis. Organic Chemistry. Synthesis and properties of heterocyclic organic compounds; oxidation of aryl amines; geological and inorganic chemical aspects of the environment.

L. Huestis, "Sodium Perborate Oxidation of an Aromatic Amine", J. Chem. Ed., 54, 326 (1977).

L. Huestis, "Chemistry of Fossilization", J. Chem. Ed., 53, 285 (1976).

F. Tobiason, L. Huestis, *C. Chandler, *S. Pedersen, and *P. Peters, "The Polar Nature of 2,1,3-Benzoxadiazole, -Benzothiadiazole, -Benzoselenadiazole and Derivatives as Determined by Their Electric Dipole Moments", J. Heterocyclic Chem., 10, 773 (1973).

NESSET, BURTON L. (b. 1934) Associate Professor. B.S., 1957, St. Olaf College, Ph.D., 1962, Purdue University. Physiological Biochemistry. Drug and hormone action.

SWANK, DUANE D. (b. 1942) Associate Professor. B.S., 1964, Washington State University; Ph.D., 1969, Montana State University. *Physical/Inorganic Chemistry*. Structure of inorganic compounds through spectrographic and crystallographic methods; inorganic complex ion studies; use of computers in undergraduate instruction.

D. Swank, "The Crystal Structure of $Cu_3Cl_6(H_2O)_2.2H_3C_4SO_{29}$ *trans*-Tetra-μ-[chlorodichlorodiaquocopper (II)] Copper (II) bis-(tetramethylene sulfone), and the Molecular Structure of $Cu_3Cl_6(H_2O)_2$ Trimer", *Inorg. Chimica Acta*, *8*, 143 (1974).

D. Swank, "The Crystal Structure of μ_4-Oxo-hexa-μ-bromotetrakis-[pyridine copper (II)], $Cu_4Br_6O(C_5H_5N)_4$", *Inorg. Chimica Acta*, *7*, 91 (1973).

TOBIASON, FRED L. (b. 1936) Professor. B.A., 1958, Pacific Lutheran University; Ph.D., 1963, Michigan State University. *Physical and Polymer Chemistry*. Polymer chemistry, dipole moments, chain configurational calculations, structure characterization.

F.L. Tobiason, *G.H. Cain and *S.M. Gregory, "Chain-Configurational Properties of Novolac Phenol-Formaldehyde Resins", *J. Poly. Sci*, Poly. Chem. Ed., *16*, 659 (1978).

F.L. Tobiason, *G.H. Cain and *J.W. Anderson, "Dipole Moment Characterization of Phenol-, O-Cresol, and p-Cresol-Formaldehyde Resins", *J. Poly. Sci*., Poly. Chem. Ed., *16*, 275 (1978).

F.L. Tobiason, *C. Chandler, *P. Negstad, and F.E. Schwarz, "Molecular Weight Characterization of Resole Phenol-Formaldehyde Resins", *Polymer Molecular Weight Method*, Ed. M. Ezrin, Advances in Chemistry Series, 1973, p. 194.

F.L. Tobiason, L. Huestis, *C. Chandler, *S.E. Pedersen, and *P. Peters, "The Polar Nature of 2,1,3-Benzoxadiazole, -Benzothiadiazole, -Benzoselenadiazole and Derivatives as Determined by Their Electric Dipole Moments", *J. Heterocyclic Chem*. *10*, 773 (1973).

Continuing Research Support, Reichhold Chemicals, Inc.

PACIFIC UNION COLLEGE
Angwin, CA 94508

Fall 1978 ug enrollment 2200
Degrees offered B.A. and B.S.
Telephone (707) 965-7597

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 1/2 2. Support staff: FTE's secretary 1/2 Stockrm 1/2 Technician ____
3. 1978 seniors & their placement: Total 25 Grad. school 1 Industry 1 Professional schools 19 Other 4.
4. Senior majors, average past five years: 17.
5. Students involved in research, average past five years: Acad. yr. 2 Summer --
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 6000 % used for teaching 95 Research 5
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR
Mass Spec.
IR
UV
AA
X-ray Diffraction
Ref. high-speed centrifuge
GC

3. Library resources: Chem. abstracts? yes Volume indices? no Collected indices? some Total journal subscriptions? ____ Computer literature search service? no Separate chemistry or science library? no Librarian? ____ Standing orders for review series and annual reviews (past five years) 4.
4. Computer facilities:

Time-sharing HP 3000

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $1,000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: none
3. Faculty teaching loads: Contact hours 13+ Load credit for research? 2-4 (beyond contract hrs.)
4. Sabbatical or leave support for research:

One quarter for each 4 years of full-time teaching.

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PACIFIC UNION COLLEGE

FACULTY PROFILE

CORDER, ARTHUR R. (b. 1924) Professor. B.A., 1951, Southern Missionary College, M.S., 1953, Vanderbilt University, Ph.D., 1956, Vanderbilt University. Inorganic Chemistry. Reduction of Carbon in Ferrochrome.

TILLAY, WAYNE E. (b. 1925) Professor. B.A., 1950, Pacific Union College, M.S., Stanford University, 1952; Ph.D., 1967, Louisiana State University. Inorganic Chemistry. Transition-metal complexes.

WINN, VERNON A. (b. 1915) Professor. B.A., 1938, Pacific Union College, M. S., 1950, University of Washington, Ph.D., 1959, Stanford University, Organic Chem. Mechanisms of Organic reactions.

VAN HISE, J. R. (b. 1937) Professor. B. S. Walla Walla College, Ph.D. 1963, University of Illinois. Physical Chemistry Nuclear and Physical Chemistry. Fourteen publications last ten years,

J. R. Van Hise and D. N. McDonald, "Electron Momentum Distribution in NH_3", The Journal of Chemical Physics 61, No. 6 (1974).

J. R. Van Hise, "Light Decay Curve of the Supernova in IC4182", The Astrophysical Journal (part 1), September 15 (1974).

J. R. Van Hise, D. C. Camp and R. A. Meyer, "Decay of the ^{134}Cs Isomers and the Levels of ^{134}Xe, ^{134}Cs and ^{134}Ba", Z Physik, A274, (1975).

D. C. Camp and J. R. Van Hise, "Weak Gamma Rays Observed in the ^{60}Co Decay", Physical Review C14, No. 1 (1976).

THE PHILADELPHIA COLLEGE OF TEXTILES & SCIENCE
Philadelphia, PA 19144

Fall 1978 ug enrollment 1575
Degrees offered B.S., M.B.A.
Telephone (215) 843-9700

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8. 2. Support staff: FTE's secretary 1 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 6 Grad. school 3 Industry 2 Professional schools 1 Other 0.
4. Senior majors, average past five years: 10.
5. Students involved in research, average past five years: Acad. yr. 5 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 30,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Varian A-60)
MS (DuPont 21-490)
DSC (P-E DSC-1B)
GC (H-P 57-50)
IR (P-E 137)
IR (P-E)
UV (P-E 139)
Beckman D.V. Spectrophotometer
GE Spectrophotometer (vis)
GC (Beckman GC-2)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 68 Computer literature search service? yes Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 20.

4. Computer facilities:

Department: Hewlett-Packard & Perkin-Elmer terminals
Campus: PRIME 500 minicomputer w. terminals

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

approx. $5000/yr.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

Sandoz Foundation Development Grant $5000.

3. Faculty teaching loads: Contact hours 12 Load credit for research? no

4. Sabbatical or leave support for research:

Faculty can apply for sabbatical at 50% salary full year, full salary ½ year. Frequency averages every 7th year.

FACULTY PROFILE

BRETT, ALISTAIR M. (b. 1943) Associate Professor and Chairman. B.Sc., 1966, University of London, Ph.D., 1970, Drexel University. Theoretical Chemistry.

Five papers 1973-1978.

P. George, M. Trachtman, A. M. Brett and C. W. Bock, Correlation Energy Contributions to Reaction Heats, Int. J. Quantum Chem., 12, 61 (1977).

P. George, M. Trachtman, C. W. Bock and A. M. Brett, An Alternative Approach to the Problem of Assessing Destabilization Energies (Strain Energies) in Cyclic Hydrocarbons, Tetrahedron, 32, 317 (1976).

P. George, M. Trachtman, C. W. Bock and A. M. Brett, An Alternative Approach to the Problem of Assessing Stabilization Energies in Cyclic Conjugated Hydrocarbons, Theoret. Chim. Acta, 38, 121 (1975).

BOCK, CHARLES W. (b. 1945) Assistant Professor. B.S., 1968, M.S., 1970, Ph.D., 1972, Drexel University. Theoretical Chemistry.

Twelve papers, 1973-1978.

P. George, C. W. Bock, M. Trachtman and A. M. Brett, Attractive-Dominant and Repulsive Dominant Hydrocarbon Reactions, Int. J. Quantum Chem., 13, 271 (1978).

G. J. Mains, P. George, C. W. Bock, M. Trachtman and A. M. Brett, A Theoretical Study of the Structure and Spectrum of 1,3,5-Hexatriene, II, J. Mol. Struct., 41, 87 (1977).

G. J. Mains, P. George, C. W. Bock, M. Trachtman and A. M. Brett, A Theoretical Study of the Structure and Spectrum of 1,3,5-Hexatriene, J. Mol. Struct., 36, 317 (1977).

C. W. Bock and R. D. Haracz, Ambiguities in the Derivation of Phase Parameters from a Perturbative Model for Elastic Nuclear-Nuclear Scattering, Phys. Rev. D, 12, 3765 (1975).

C. W. Bock and R. D. Haracz, Nonlinear Model for Elastic Nuclear-Nuclear Scattering Outside the Core, Phys. Rev. D, 11, 2662 (1975).

RIVLIN, JOSEPH (b. 1934) Professor. M.Sc., 1960, Ph.D., 1965, Hebrew University. Textile and Polymer Chemistry. Flame retardant chemical finishes, polymer synthesis.

CELIKIZ, GULTEKIN (b. 1930) Associate Professor. B.S., 1950, Robert College, M.S., 1956, Georgia Institute of Technology. Analytical Chemistry. Color measurement and dyestuff analysis.

G. Celikiz, Infra-red and Raman Spectroscopy, vol 1 B Practical Spectroscopy Series, Marcel Dekker Inc. (1977).

DOWDEN, EDWARD E. (b. 1939) Associate Professor. B.S., 1963, Duke University, M.S., 1968, Ph.D., 1968, University of Pennsylvania. Biochemistry.

GALL, JOHN F. (b. 1913) Professor Emeritus. B.S., 1935, Northwestern University, Ph.D., 1939, University of Chicago. Inorganic Chemistry. Chemistry of fluorine.

GRADEL, GEORGE J. (b. 1921) Associate Professor. B.A., 1943, LaSalle College, M.S., 1955, Drexel University. Textile Chemistry. Dyestuff chemistry, flammability.

G. Gradel, Effect of Disperse Dyes on Certain Flammability Characteristics of Polyester, Textile Chemist and Colorist, Dec. (1978).

KAPLAN, MOREY (b. 1927) Associate Professor. B.S., 1957, Philadelphia College of Textiles and Science. General and Analytical Chemistry.

NEMEROFF, NORMAN H. (b. 1936) Associate Professor. B.S., 1962, Philadelphia College of Textiles and Science, Ph.D., 1976, University of Pennsylvania. Organic Chemistry. Polymer synthesis, dyestuff synthesis.

N. H. Nemeroff and M. Joullie, Photolysis of Some Heterocyclic Analogs of 3,3,5,5-Tetramethylcyclohexanone, J. Org. Chem., 43, 331 (1978).

TRACHTMAN, MENDEL (b. 1929) Professor. A.B., 1951, Temple University, M.S., 1956, Drexel University, Ph.D., 1961, University of Pennsylvania. Physical Chemistry. Photochemistry of cellulose, quenching cross-sections of aromatic compounds.

Ten publications, 1973-1978.

M. Halmann and M. Trachtman, The Photochemistry of Phosphorus Compounds II - Photolysis of D potassium α-Glucose-1-phosphate, J. Chem. Soc. Perkin Trans II, 132 (1977).

P. George, C. W. Bock, M. Trachtman and A. M. Brett, Homodesmotic Reactions for the Assessment of Stabilization Energies in Benzenoid and Other Conjugated Cyclic Hydrocarbons, J. Chem. Soc., Perkin Trans II, 1222 (1976).

P. George, M. Trachtman and C. W. Bock, Comparison of Various Isodesmic and Homodesmotic Reaction Heats with Values derived from Published Ab Initio Molecular Orbital Calculations, J. Chem. Soc., Perkin Trans. II, 1036 (1977).

P. George, M. Trachtman, C. W. Bock and A. M. Brett, The Use of 90°-1,3-Butadiene as a Reference Structure for the Evaluation of Stabilization Energies for Benzene and Other Conjugated Cyclic Hydrocarbons, Tetrahedron, 32, 1357 (1976).

POINT LOMA COLLEGE
San Diego, CA 92106

Fall 1978 ug enrollment 1749
Degrees offered B.A.
Telephone (714) 222-6474

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3 . 2.Support staff: FTE's secretary 1 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 7 Grad. school 4 Industry 0 Professional schools 2 Other 1 .
4. Senior majors, average past five years: 6 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 6,500 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (Varian T-60A)
MS (Varian EM 600)
UV-Vis (P-E 202)
IR (P-E 337)
Spinning Band Column (Nester-Faust)
GC (HP 5730A, 5750, & 700; Varian A90-P)
Low Pressure Hydrogenator (Parr 3911)
High Pressure Monel Reactor (Parr 4751, & Parr Rocker Type 4021)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? no Total journal subscriptions? 15 Computer literature search service? begin 1979 Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 5 .
4. Computer facilities: General Automation System 16-440.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. $3,000/yr chemicals, glassware, and instrument repair; Approx. $2,500 overhead; Research Associates of Point Loma College (Chemistry Alumni Support Group) $9,000.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: DuPont College Science Grant, $6,500,
3. Faculty teaching loads: Contact hours 16 Load credit for research? 10%
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at full salary for 2/3 of a year. Eligible every 7th year.

FACULTY PROFILE

CHRISTENSEN, VAL J. (b. 1926) Professor and Associate Dean of the College. B.A., 1948, Bethany Nazarene College, Ph.D., 1952, University of Kansas. *Inorganic Chemistry*. Non-aqueous solvent systems.

V. L. Heasley, V. J. Christensen, and G. E. Heasley, *Chemistry and Life in the Laboratory*, Burgess, 1978.

HEASLEY, VICTOR L. (b. 1937) Professor and Department Chairman. B.A., 1959, Hope College, Ph.D., 1963, University of Kansas, *Organic Chemistry*. Electrophilic additions to olefins, dienes, and acetylenes. Synthesis and neighboring group effects.

Thirty one publications, 1961-1978.

V. L. Heasley, V. J. Christensen, and G. E. Heasley, *Chemistry and Life in the Laboratory*, Burgess, 1978.

V. L. Heasley, D. F. Shellhamer, *J.A. Iskikian, *D.L. Street, and G.E. Heasley, A Comparison of the Addition of Bromine Chloride to 1-Hexene and 1-Hexyne, *J. Org. Chem.*, *43*, 3139 (1978).

G.E. Heasley, *J.M. Bundy, V.L. Heasley, *S. Arnold, *A. Gipe, *D. McKee, *R. Orr, *S.L. Rogers, and D.F. Shellhamer, Electrophilic Additions to Dienes and the 1-Phenylpropenes with Pyridine-Halogen Complexes and Tribromides. Effects of Stereochemistry and Product Ratios, *J. Org. Chem.*, *43*, 2793 (1978).

V.L. Heasley, *K.D. Rold, *D.R. Titterington, *C.T. Leach, *B.T. Gipe, *D.B. McKee, and G.E. Heasley, Chlorinations of Olefins and Dienes with Antimony Pentachloride, *J. Org. Chem.*, *41*, 3997 (1976).

V.L. Heasley, *D.R. Titterington, *T.L. Rold, and G.E. Heasley, Brominations of Nitroalkenes with Alkyl Hypobromites, *J. Org. Chem.*, 41, 1285 (1976).

Grants Active, 1977-78; PRF-B, $5,500. Research Corporation, (w/Gene Heasley, Bethany Nazarene College), $1,700.

MC CONNELL, MICHAEL(b. 1949) Assistant Professor biology and chemistry department. B.A., 1971, Pasadena College, Ph.D., 1976, Tufts University School of Medicine, *Molecular Biology and Microbiology*. Virus-Host Cell Interactions.

Eight publications, 1971-1978.

McConnell, M., and A. Wright, An Anaerobic Technique for Increasing Bacteriophage Plaque Size, *Virology*, *65*, 588 (1975).

McConnell, M., and A. Wright, Variation in the Structure and Phage-Inactivating Capacity of *Salmonella Anatum* Lipopolysaccharide as a Function of Growth Temperature, *Journal of Bactenology*, in press.

McConnell, M. Reznick, A., and A. Wright, Studies on the Initial Interactions of Bacteriophage ^{15} with its Host Cell, *Salmonella anatum*. I. Physical parameters of Adsorption, O-antigen Depolymenzation and Phage DNA Ejection, and the Role of the Phage Tail Protein in these Processes, *Virology*, in press.

McConnell, M.R., and Blumberg, P.M., Subunit Structure of Surface and Shed, Large, External, Transformation-Sensitive Protein of Chick Embryo Fibroblasts. *Ann. N.Y. Acad. Sci.* *312*, 418 (1978).

McConnell, M.R., Blumberg, P.M., and Rossow, P.W., The Oligomeric Structure of the Large External Transformation-Sensitive Protein (LETS) of Chick Embryo Fibroblasts, *Journal of Biological Chemistry*, in the press.

POINT LOMA COLLEGE

SHELLHAMER, DALE F. (b. 1942) Associate Professor. B.A., 1969, University of California Irvine, Ph.D. 1974, University of California Santa Barbara, *Organic Chemistry*, Physical Organic properties of fluorocarbons. Electrophilic additions to unsaturated hydrocarbons.

Thirteen publications.

D.F. Shellhamer, V.L. Heasley, G.E. Heasley, *J.E. Foster, and *J.K. Luttrull, Additions to 2,4-Dienes: Ionic and Radical Additions to Ethyl Sorbate, *J. Org. Chem.*, *43*, 2652 (1978).

D.F. Shellhamer and *M.L. Oakes, Addition of Halogens to Cyclopropylacetylene, *J. Org. Chem.*, *43*, 1316 (1978).

G.E. Heasley, *W.E. Emery III, *R. Hinton, D.F. Shellhamer, V.L. Heasley, and *S. Rogers, A Study of the Stereochemistry of the Addition of Methyl and *t*-Butyl Hypochlorite to Cyclopentadiene, *J. Org. Chem.*, *43*, 361 (1978).

D.F. Shellhamer, V.L. Heasley, G.E. Heasley, *J.E. Foster, and *J.K. Luttrull, Addition to 2,4-Dienes: The Halogenation of Ethyl Sorbate, *J. Org. Chem.*, *42*, 2141 (1977).

D.F. Shellhamer, *D.B. McKee and *C.T. Leach, Addition of Halogens to Vinylcyclopropanes, *J. Org. Chem.*, *41*, 1972 (1976).

Grant Active, 1978; American Heart Association, California Affiliate, $5,900.

POMONA COLLEGE

Claremont, CA 91711

Fall 1978 ug enrollment 1,362

Degrees offered B.A.

Telephone (714)621-8000 Ext. 2225

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 1½ Stockrm 1 Technician 1½
3. 1978 seniors & their placement: Total 15 Grad. school 5 Industry 2 Professional schools 4 Other 4 .
4. Senior majors, average past five years: 14 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 11
6. National student honors, past five years (NSF fellowships, etc.)

3 - National Science Foundation Graduate Fellowships

1 - Fulbright-Hays Grant

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 56,400 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

MS(Hitachi R.M.U.-61D)
NMR(Varian A-60)
ORD-CD(Cary 60)
UV-Vis(Gilford 2400, Cary 14, and Cary 15)
IR(Perkin-Elmer 297 and 21)
Stopped-Flow and T-Jump System (Durrum D-115)
Analytical Ultracentrifuge (Beckman Model E)
Polarograph (PAR 171)
LC(Waters 201 with Varian Variscan Detector)
Liquid Scintillation System (Beckman LS-100C)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 160 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 30 .
4. Computer facilities: Department; minicomputer, PDP11/10.
Campus; IBM 360/40 and DEC-10 computers.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: For capital equipment (for research and teaching) receives $10,000 per year. Small grants available from all-college research fund/ about $18,000, total.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: NSF-URP, $10,800; du Pont College Science Grant, $6,500,; General Electric Foundation Grant, $4,000; California Foundation for Biochemical Research, $1,000.
3. Faculty teaching loads: Contact hours 12 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leaves at 50% salary for full year or full salary for ½ year every seventh year or 50% salary for a semester every seventh semester. Additional subvention funds can to raise level to about 80% salary if outside grants are not obtained.

ALLEN, C. FREEMAN (b.1928) Professor. B.S., 1948, University of California, Berkeley, Ph.D., 1952, University of Wisconsin. *Organic Chemistry and Biochemistry*. Lipid-protein interactions; biological membranes; photosynthesis.

L. I. Rice, L. Spolter, and C. F. Allen, Preparation and Thin Layer Chromatography of Sulfate Conjugates of the Component Oligomers of Triton X-100, *J. Chromatogr. 137*, 397 (1977).

C. F. Allen and L. I. Rice, Separation of Triton X-100 and Similar Mixtures into Component Oligomers, *J. Chromatogr. 110*, 151 (1975).

BEILBY, ALVIN L. (b. 1932) Professor and Chairman. B.A., 1954, San Jose State College, Ph.D., 1958, University of Washington. *Analytical Chemistry.* Electroanalytical chemistry; nature of carbon electrodes; environmental analysis.

A. L. Beilby, editor, "Modern Classics in Analytical Chemistry", Volume II, American Chemical Society, Washington, D.C., 1976.

E. E. Hughes, W. D. Dorko, E. P. Scheide, L. C. Hall, A. L. Beilby, and J. K. Taylor, Gas Generation Systems for the Evaluation of Gas Detecting Devices, *National Bureau of Standards Report* NBSIR 73-292.

HANSCH, CORWIN (b.1918) Professor. B.S., 1940, University of Illinois, Ph.D., 1944, New York University. *Organic Chemistry and Medicinal Chemistry.* Correlation of chemical structure and biological activity.

Fifty-seven publications, 1973-1978

C. Hansch, R. N. Smith, *A. Rockoff, *D. F. Calef, P.Y.C. Jow, and J. Y. Fukunaga, Structure-Activity Relationships in Papain and Bromelain Ligand Interactions, *Arch. Biochem. Biophys. 183*, 383 (1977).

S. H. Unger and C. Hansch, Quantitative Models of Steric Effects, *Prog. Phys. Org. Chem.*, *12*, 91 (1976).

C. Silipo and C. Hansch, Structure-Activity Relationships of Triazines Inhibiting Dihydrofolate Reductase, *J. Amer. Chem. Soc.*, *97*, 6849 (1975).

C. Hansch, On the Structure of Medicinal Chemistry, *J. Med. Chem.*, *19*, 1 (1976).

C. Hansch, Drug Research or the Luck of the Draw, *J. Chem. Ed.*, *51*, 360 (1974).

Grants active 1977-1978: National Institutes of Health Grant, $121,887, Correlation of Chemical Structure with Biological Activity; National Cancer Institute Contract, $50,170, Relationship of Chemical Structure to Antitumor Activity of Drugs in the National Cancer Institute Files.

LONG, GEORGE L. (b.1943) Assistant Professor. B.S., 1966, Pacific Lutheran University. Ph.D., 1971, Brandeis University. *Biochemistry and Enzymology.* Comparative enzymology of glycolytic enzymes.

Seven publications, 1973-1978

G. L. Long, *J. R. Cook, and W. R. Ellington, Evidence for the Non-Hydrophobic Interaction of Aromatic Nitrogen-Containing Compounds with the Coenzyme Binding Site of a NAD-Linked D-Lactate Dehydrogenase, *Experientia*, *34*, 567 (1978).

W. R. Ellington and G. L. Long, Purification and Characterization of a Highly Unusual Tetrameric D-Lactate Dehydrogenase from the Muscle of the Giant Barnacle, *Balanus nubilus* Darwin, *Arch. Biochem. Biophys.*, *186*, 265 (1978).

G. L. Long and *E. L. Moore, Affinity Chromatography of D-Lactate Dehydrogenases from *Limulus Polyphemus* (Horseshoe Crab) and *Haliotus Sp.* (Abalone) Voluntary Muscle on 8-(6-aminohexyl)-aminoadenine dinucleotide-Sepharose, *J. Solid-Phase Biochem.*, *1*, 307 (1976).

F. H. Gleason and G. L. Long, Alcohol Dehydrogenase in Mucorales III, *Mycologia 68*, 426 (1976).

G. L. Long, The Stereospecific Distribution and Evolutionary Significance of Invertebrate Lactate Dehydrogenases, *Comp. Biochem. Physiol. 53B*, 77 (1976).

Grants active 1977-1978: National Institutes of Health Grant, $27,028, Comparative Enzymology of Invertebrate Lactate Dehydrogenase.

SMITH, R. NELSON (b.1916) Professor. B.A., 1938, Pomona College, Ph.D., 1942, Stanford University. Physical Chemistry. Hydrophobic interaction of small molecules with macromolecules.

Six publications, 1973-1978

C. Hansch, R. N. Smith, *A. Rockoff, *D. F. Calef, P.Y.C. Jow, and J. Y. Fukunaga, Structure-Activity Relationships in Papain and Bromelain Ligand Interactions, Arch. Biochem. Biophys.,183 383 (1977).

R. N. Smith, *T. P. Poindexter, and C. Hansch, Kinetics and Thermodynamics of the Slow Hydrophobic Deactivation of α-Chymotrypsin, Physiol. Chem. and Physics., 7, 423 (1975).

C. Hansch, R. N. Smith, and R. Engle, Quantitative Structure-Activity Relationships in Drugs, Pharmacological Basis of Cancer Chemotherapy, Williams and Wilkins, Baltimore, Md., 1975, pp 215-234.

R. N. Smith, C. Hansch, and M. M. Ames, Selection of a Reference Partitioning System for Drug Design Work, J. Pharm. Sci., 64, 599 (1975).

R. N. Smith, C. Hansch, *T. P. Poindexter, Parabolic Hydrophobic Inhibition of α-Chymotrypsin, Physiol. Chem. & Physics., 6, 323 (1974).

STEINMETZ, WAYNE E. (b.1945) Assistant Professor. A.B., 1967, Oberlin College, A.M., 1968, Ph.D., 1973, Harvard University. Physical Chemistry and Molecular Spectroscopy. Molecular structure and spectroscopy; the application of low resolution microwave spectroscopy to confirmational analysis; analysis of circular dichroism spectra of proteins.

W. E. Steinmetz, *J. Hollenberg, *F. Hickernell, *C. E. Orr, and L. H. Scharpen, The Confirmational Analysis of Substituted Alkenes by Low Resolution Microwave Spectroscopy, J. Phys. Chem., 82, 940 (1978).

W. E. Steinmetz, *F. Hickernell, *I. K. Mun, and L. H. Scharpen, The Conformational Analysis of 1-Haloalkanes by Low Resolution Microwave Spectroscopy, J. Mol. Spectrosc.,68, 173 (1977).

W. E. Steinmetz, D. H. Robinson, and M. N. Ackermann, Kinetics of the Alkaline Hydrolysis of Hydroxylamine-O-sulfonic Acid and Its Reactions with Hydrazine, Inorg. Chem., 14, 421 (1975).

W. E. Steinmetz, Application of Low Resolution Microwave Spectroscopy to Conformational Analysis, J. Amer. Chem. Soc., 96, 685 (1974).

UNIVERSITY OF PUGET SOUND
Tacoma, WA 98416

Fall 1978 ug enrollment 2750
Degrees offered B.S., M.S.
Telephone (206) 756-3123

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 16 Grad. school 6 Industry 5 Professional schools 4 Other 1 .
4. Senior majors, average past five years: 16 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)
   Rhodes Scholar (1)
   NSF Fellowships (2)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 35,000 % used for teaching 60 Research 40
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR (T-60)
   Mass Spec (CEC 121)
   UV-VIS (Cary 11, Beckman DK-2)
   X-ray Fluorescence (Norelco)
   X-ray Diffraction (Phillips)
   AA (Fisher, Southern Analytical A-3000)
   GC (Pye, Varian)
   LC (Waters)
   IR (Beckman IR-20)
   Fluorescence (Turner)
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 44 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 16 annually .
4. Computer facilities: Department; minicomputer, PET and Ohio Sci. 6502, two micro CRT terminals. Campus; DEC 11/70, 4 terminals at Science bldg.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $2,000/year. chemicals and glassware; $2,00/yr. equipment
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   U.S. Office of Ed. $13,500
   NSF $8000
   Private company, unnamed $15,000
3. Faculty teaching loads: Contact hours 16 Load credit for research? 4 hr every 3rd sem.
4. Sabbatical or leave support for research:
   Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 7th year. Leave of absence granted on request.

FACULTY PROFILE

BERRY, Keith O. (b. 1938) Professor. B.S. 1960, N. Colorado Univ., Ph.D., 1965, Iowa State Univ. Inorganic Chemistry. Coordination Chemistry and Forensic Chemistry.

Forensic Science: A Course for the January Interim, K.O. Berry and W.G. Nigh, J. Chem. Educ. 50, 208(1973).

ROUSSLANG, Kenneth (b. 1948) Asst. Professor. B.S. 1970, Portland State Univ., Ph.D., 1976, Univ. of Washington. Phosphorescence, fluorescence and optical detection of magnetic resonance (ODMR) in biological systems; Energy transfer involving excited states. Physical Chemistry.

Fifteen puglications (1976-78)

Triplet-Triplet Energy Transfer in the Tryptophyl-Tyrosinate Dipeptide, K.W. Rousslang, A.L. Kwiram, Chem. Phys. Lett. 39, 231 (1976).

Conformation of Polypeptide Hormones by Optically Detected Magnetic Resonance, and a Zimm-Bragg Analysis of Helical Folding in Glucagon, D.A. Deranleau, J.B.A. Ross, K.W. Rousslang, and A.L. Kwiram, J. Am. Chem. Soc., 100, 1913(1978).

The Triplet State of Tryptophan in Proteins. The Nature of the Optically Detected Magnetic Resonance Lines, K.W. Rousslang, J.B.A. Ross, A.L. Kwiram, D.A. Ceranleau, Biochemistry 17, 1087(1978).

ROWLAND, Thomas V (b. 1946) Asst. Professor. B.A. 1968, The Catholic University of America, Ph.D., 1975, University of California, Berkeley. Physical Inorganic Chemistry. Aqueous solution transition metal and lanthanide ion complexes; magnetic resonance techniques.

Aqueous Solution Transition Metal and Lanthanide Ion Complexes. Lawrence Berkeley Laboratory Report N. 3122, 1975.

MEHLHAFF, Leon Curtis (b. 1940) Assoc. Professor. B.S. Univ. California, Berkeley, 1961. Ph.D. 1965, Univ. of Washington. Analytical Chemistry, Polymer Chemistry. Chemistry of Polymer Systems, instrumental analytical chemistry.

NIGH, Wesley G. (b. 1936) Assoc. Professor. B.S. 1960, Univ. of California, Los Angeles, Ph.D., 1965, Univ. of Washington. Physical Organic Chemistry. Investigation of reaction mechanisms by chemical kinetics and isotopic labelling techniques. Mechanisms of enzyme catalyzed reactions.

Steric Effects in Cupric Ion Oxidation of α-Ketols. H.A. Connon, B.G. Sheldon, K.E. Harding, L.E. Letterman, D.C. Fulton, and W.G. Nigh, J. Org. Chem. 38, 2020 (1973).

TOMS-WOOD, Anne (b. 1943) Asst. Professor. B.S. 1966, Univ. of Illinois, Ph.D. 1970, Univ. of Illinois. Biochemistry. Enzyme degredation reactions.

BLAND, Jeffrey S. (b. 1944) Assoc. Professor. B.S. 1967, Univ. of California, Irvine, Ph.D., 1971, Univ. of Oregon. Organic Chemistry. Role of the biological antioxidants in retardation of lipid peroxidation and the relationship between hair trace mineral levels and blood chemical parameters. 18 publications 1969-78.

Biochemical Consequences of Lipid Peroxidation, J.S. Bland, J. Chem. Educ. 55, 151 (1978).

Biochemical Effects of Excited State Oxygen, J.S. Bland, J. Chem. Educ. 53, 2902 (1976).

UNIVERSITY OF REDLANDS

Redlands, California 92373

Fall 1978 ug enrollment 1206

Degrees offered B.A., B.S.

Telephone (714) 793-2121

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2. Support staff: FTE's secretary 0.3 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 1 Grad. school ______ Industry ______ Professional schools ______ Other 1 .
4. Senior majors, average past five years: 6 .
5. Students involved in research, average past five years: Acad. yr. 2 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)
   None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 14,000 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR-Varian, Model T-60
   IR-Beckman IR-12, Perkin-Elmer 137
   UV-Vis-Beckman DB, Cary 14, Beckman DU
   MS-Varian, Model EM-600
   Analytical Ultracentrifuge - Spinco Model E
   Membrane Osmometer - Hewlett-Packard Model 503
   Amino acid analyzer - Spinco Model 118
   Automatic titrator - Radiometer
   Densimeter - Anton Paar
   Polarimeter- Perkin-Elmer Model 241
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 23 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 5 .
4. Computer facilities: Terminal access to HP-2000. Campus: IBM-1130

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $3,000/yr. chemicals, glassware and equipment
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Stauffer Charitable Trust, $50,000 for equipment this year and $15,000/yr. for library support for the division each of the past three years.
3. Faculty teaching loads: Contact hours 12/wk Load credit for research? Occasional
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for ½ year. Frequency averages every 7th year.

HOLLENBERG, J. LELAND (b. 1926) Professor. B.A., 1949, B.S., 1952, University of Redlands, M.S., 1952, University of California, Berkeley, Ph.D., 1962, University of Southern California. Physical Chemistry. Absolute infrared intensities in condensed phase. Hydration numbers of biochemicals.

*G.W. Hart and J. L. Hollenberg, Absolute Infrared Intensities of ClO_3^- and SCN^-, Spectrochimica Acta 34A, 367 (1978).

IFFT, JAMES B. (b. 1935) Professor. B.S., 1957, Pennsylvania State University, Ph.D., 1962, California Institute of Technology. Biophysical Chemistry. Density gradient centrifugation; hydration studies; partial specific volumes.

Sixteen publications, 1973-1978.

Graves-Pedersen, Torben and Ifft, James B. Buoyant Titration of Ovalbumin in Four Alkali Halides. Hydration and Ion Binding. Carlsberg Research Comm., 43, 65-76 (1978).

Ifft, James B. and Graves-Pedersen, Torben. Buoyant and Potentiometric Titrations of Synthetic Polypeptides III. Poly-L-Lysine and Poly-L-Histidine in Five Salt Solutions. Carlsberg Research Communications 43, 49-64 (1978).

*Sharp, Dan S., *Fujita, Norman, *Kinzie, Kathleen, and Ifft, J.B. Compressibility Studies of Three Proteins in CsCl Solutions in the Analytical Ultracentrifuge. Biopolymers 17, 817-836 (1978).

Ifft, James B. Sedimentation Equilibrium of Proteins in Density Gradients. Biophys. Chem. 5, 137-157 (1976).

Hearst, John E. and Ifft, James B. Contemporary Chemistry, a textbook for general chemistry. W.H. Freeman and Co., San Francisco (1976).

KRANTZ, REINHOLD J. (b. 1915) Professor. A.B., 1936, Greenville College, M.S., 1937, University of Illinois, Ph.D., 1947, Michigan State University. Organic Chemistry. Physical properties of alcohols and sulfone synthesis.

ROBERTS JR., JULIAN L. (b. 1935) Professor. A.B., 1957, University of Southern California, Ph.D., 1962, Northwestern University. Analytical Chemistry. Electrochemistry of dioxygen and hydrogen peroxide in aprotic solvents.

D.T. Sawyer and J.L. Roberts, Jr., Experimental Electrochemistry for Chemists, John Wiley and Sons, Inc., New York (1974).

*J.E. Ruark, *J.I. Ivers, and J.L. Roberts, Jr., The DCl-HBr Isotope Exchange Equilibrium - A Statistical and Experimental Exercise for the Physical Chemistry Laboratory, J. Chem. Educ., 51, 758 (1974).

J.B. Ifft and J.L. Roberts, Jr., Frantz/Malm's Essentials of Chemistry in the Laboratory, 3rd ed., W.H. Freeman and Co., San Francisco (1975).

J.L. Roberts, Jr., and J.B. Ifft, Frantz/Malm's Chemical Principles in the Laboratory, 2nd ed., W.H. Freeman and Co., San Francisco (1977).

J.L. Roberts, Jr., M.M. Morrison, and D.T. Sawyer, Base-Induced Generation of Superoxide Ion and Hydroxyl Radical from Hydrogen Peroxide, J. Am. Chem. Soc., 100, 329 (1978).

REED COLLEGE

Portland, OR 97202

Fall 1978 ug enrollment 1131

Degrees offered B.A.

Telephone 503-771-1112

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5.25 2. Support staff: FTE's secretary 0.8 Stockrm 1.0 Technician 0
3. 1978 seniors & their placement: Total 17 Grad. school 5 Industry 3
Professional schools 5 Other 4.
4. Senior majors, average past five years: 15.
5. Students involved in research, average past five years: Acad. yr. 15 Summer 20
6. National student honors, past five years (NSF fellowships, etc.)
3 NSF graduate fellowships; 1 Churchill fellowship;
1 Fulbright fellowship; 1 NIH fellowship; 1 Rhodes scholarship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,180 % used for teaching 42 Research 29
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

AA: Instrumentation Laboratories Model 151 spectrometer and Model 555 Flameless Atomizer
Multi-channel analyzer (radiochem)
Radiometer pHstat automatic titrator
GC: Varian Models 1800, 2400, autoprep
Hydrogenators: med and high pressure
IR: Perkin-Elmer Model 599
NMR: Perkin-Elmer/Hitachi Model R-20B
Nuclear Reactor: Gulf Gen. Atomic, Mark 1
Stopped flow apparatus: Durrum SF spectrophotometer/fluorometer
UV-Vis: Beckman DK-2, Perkin-Elmer 200, Varian 635

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? thro' 8CI
Total journal subscriptions? 63 Computer literature search service? no
Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) ______.

4. Computer facilities: DEC PDP 11/35 computer with teal time data acquisition equipment; DEC PDP 11/70 computer with 15 terminals; EAI Model TR20 analog computer

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: ca. $9000 student wages only

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: DuPont grant $6500; NSF/URP $9800; ACS/FRED approx. $1,000.

3. Faculty teaching loads: Contact hours 14 Load credit for research? nil

4. Sabbatical or leave support for research: Released time via NSF/CAUSE grant; one can apply for sabbatical leave (1 sem. at full pay or one year at half pay) at tenure and every 7th year thereafter.

BLOCH, WILL. (b. 1943) Assistant Professor. B.A., 1965, Swarthmore College, Ph.D., 1970, University of Oregon. *Biochemistry and Physical Chemistry*. Optical and rapid reaction techniques to study mechanisms of enzyme catalysis, with special emphasis on subunit interactions in enzymes possessing molecular symmetry.

M.J. Schlesinger, W. Bloch, and P.M. Kelley, "Differences in the Structure, Function, and Formation of Two Isozymes of *E. coli* Alkaline Phosphatase," in C.L. Markert (editor), Isozymes, Vol. I, Molecular Structure (1975), pp. 333-342.

W. Bloch and *D. Bickar, "Phosphate Binding to *Escherichia coli* Alkaline Phosphatase, Evidence for Site Homogeneity," *Journal of Biological Chemistry*, *253*, 6211 (1978).

Grants active: U.S. Public Health Service (1977-78), $1700; Research Corporation (1978), $1800; NSF (1978-1980), $53,000; a further PHS award is pending.

CHURCH, LARRY B. (b. 1939) Associate Professor and Director of the Nuclear Reactor Facility. B.S., 1961, University of Rochester, M.S. (1964), and Ph.D. (1966), Carnegie Institute of Technology. *Analytical and Radiochemistry*. Nuclear reactions induced by high energy protons and pions; trace elemental analysis as applied to oceanographic systems.

Seven research publications, 1973-1978.

M.Kikuchi and L.B. Church, "Spin States of Iodocarbene," *Radiochim. Acta*, *20*, 81 (1973).

R.L. Kathren and L.B. Church, "Mean and Effective Photon Energies of ^{226}Ra in Equilibrium with Daughters," *Health Physics*, *30*, 143 (1976).

M. Kikuchi and L.B. Church, "Chemical and Physical Factors which Control the Substitution Reactions of Direct Fission-Produced Iodine with Gaseous Methane and the Methyl Halides," *Radiochim. Acta*, *23*, 79 (1976).

A. Owunwanne, L.B. Church, and M. Blau, "Effect of Oxygen on the Reduction of Pertechnetate by Stannous Ion," *J. Nucl. Med.*, *18*, 822 (1977).

M. Kikuchi and L.B. Church, "The Substitution Reactions of Iodine Produced by the β^- Decay Process with Gaseous Methane and Methyl Halide," *Radiochim. Acta*, in press.

Grants active: a total of approx. $33,700 from various sources for the Nuclear Reactor Facility, its operation in a N.W. Area Consortium, and computerized data analysis.

CRONYN, Marshall W. (b. 1919) Professor of Chemistry. B.A., 1940, Reed College, Ph.D., 1944, University of Michigan. *Organic Chemistry*. Chemistry of lignin; synthesis of sulfur and fluorine containing organic structures; problems in chemotherapy.

E.H. Mørkved and M.W. Cronyn, "Synthesis of Some Substituted Picolinimidoyl Chloride Hydrochlorides," *Acta Chemica Scandinavica*, *B32*, 231 (1978).

Grants active: NSF/URP (director) for 1978-1979, $9,900; Union Carbide Co., $2400, Compounds of Possible use in Agricultural Chemistry; NIH, $2400, Synthesis of Compounds Active in Several Cancer Chemotherapy screenings.

DUNNE, THOMAS G. (b. 1930) Associate Professor of Chemistry. B.S., 1952, University of California/Los Angeles, Ph.D., 1957, University of Washington. Inorganic Chemistry. Studies of electron transfer mechanisms in solution.

HANCOCK, JOHN E.H. (b. 1929). Professor of Chemistry and Chairman. B.Sc., 1950, University of London, Ph.D., 1952, Imperial College of Science and Technology. Organic Chemistry. Chemistry of azides; routes to dodecahedrane; electrochemical syntheses; the literature of organic chemistry.

*N.G. Galakatos, J.E.H. Hancock, *O.M. Morgan, *M.R. Roberts, and *J.K. Wallace, "On the Use of Ceric Salts as Coupling Agents; Part 1," Synthesis, 472 (1978).

WEIR, WILLIAM D. (b. 1941). Associate Professor of Chemistry. A.B., 1962, Occidental College, A.M. (1964) and Ph.D. (1965), Princeton University. Physical Chemistry. Theoretical and experimental studies of the dynamics of chemical and electrochemical reactions; investigations of transport; applications of computer technology to simulation of dynamic systems and to chemical instrumentation.

Grants active: $20,000 from Tektronix Foundation to support development of real time software for instrumental data acquisition and for processing and graphic display of data.

UNIVERSITY OF RICHMOND
Richmond, VA 23173

Fall 1978 ug enrollment 2,775
Degrees offered B.S., M.S.
Telephone (804) 285-6381

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7 . 2.Support staff: FTE's secretary 1 Stockrm 1/2 Technician 0
3. 1978 seniors & their placement: Total 29 Grad. school 3 Industry 5 Professional schools 10 Other 11 .
4. Senior majors, average past five years: 25 .
5. Students involved in research, average past five years: Acad. yr. 10 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 35,000 % used for teaching 90 Research 10
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   UV-Vis (Beckman Acta CIII, Perkin-Elmer 450)
   NMR (Perkin-Elmer R24A)
   MS (Varian EM600)
   AA (Jarrell-Ash 82-500, Perkin Elmer 303)
   GC (Fand M 810 and Varian1400)
   IR (Beckman IR-8)
   Fluorometer (Aminco-Bowman J48990)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 114 Computer literature search service? yes Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 21 .

4. Computer facilities: 15 terminals w/access to a Hewlett-Packard 2000 Access Computer at the U. of VA. Nine of the terminals are in a cluster in the Science Ctr. A control Data 200UT remote batch terminal w/access to a Cyber 172 Computer at the U. of VA.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $3,000/yr. for equipment

   Approximately $3,000 per year chemicals and glassware
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   Title VI - $9,800
3. Faculty teaching loads: Contact hours 12 Load credit for research? occasional

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency every seventh year.

FACULTY PROFILE

BELL, ROBERT H. (b. 1928) Instructor. B.A. 1949, Virginia Polytechnic Institute and State University, B.S. in Pharmacy 1956, Virginia Commonwealth University, Graduate study in Pharmaceutical Chemistry 1958-61, Virginia Commonwealth University. Inorganic Chemistry.

CLOUGH, STUART C. (b. 1943) Assistant Professor. B.S. 1965, University of Richmond, Ph.D. 1969, University of Florida. Organic Chemistry. Synthesis, mechanisms, aziridine chemistry, photochemistry of cyclobutendione.

J. Deyrup and S. Clough, Interconversions of Aziridine Carboxylates and β-lactams, J. Org. Chem., 39, 902 (1974).

W. Johnson, R. Hale and S. Clough, Formation of Molecular Nitrogen By a Burning Cigarette, Nature, 244, 51 (1973).

W. Johnson, R. Hale, S. Clough and P. Chen, Chemistry of the Conversion of Nitrate Nitrogen to Smoke Products, Nature, 243, 223 (1973).

S. Clough, J. Kang, W. Johnson and T. Osdene, Thermal Fragmentation of Maleic Hydrazide, Chem. and Ind., 323 (1973).

DeTOMA, ROBERT P. (b. 1944) Assistant Professor. B.S. 1966, St. Anselm's College, Ph.D. 1973, Johns Hopkins University. Physical Chemistry. Time-dependent spectroscopy, excited state solvation, radiationless transitions, adiabatic photophysical reactions, energy transfer, biological applications of fluorescence, electron impact spectroscopy, diffusion limited processes.

J.H. Easter, R.P. DeToma and L. Brand, Fluorescence Measurements of Environmental Relaxation at the Lipid-Water Interface Region of Bilayer Membranes, Biochem. et Biophys. Acta., 508, 27 (1978).

R.P. DeToma and L. Brand, Excited State Solvation Dynamics of 2-Anilinonaphthalene, Chem. Phys. Lett., 47, 231 (1977).

A. Gafni, R.P. DeToma, R.L. Manrow and L.Brand, Nanosecond Decay Studies of a Fluorescence Probe Bound to Apomyoglobin, Biophysical Journal, 17, 155 (1977).

R.P. DeToma, J.H. Easter and L. Brand, Dynamic Interactions of Fluorescence Probes with the Solvent Environment, J. of the Amer. Chem. Soc., 98, 5001 (1976).

J.H. Easter, R.P. DeToma and L. Brand, Nanosecond Time-Resolved Emission Spectroscopy of a Fluorescence Probe Absorbed to L-alf-Egg Lecithin Vesicles, Biophysical Journal, 16, 571 (1976).

GILLESPIE, JESSE SAMUEL, JR. (b. 1921) Professor. B.S. 1943, Virginia Military Institute, Ph.D. 1949, University of Virginia. Organic Chemistry. Medicinal chemistry, aromatic and heterocyclic systems.

J.S. Gillespie, Jr., S.P. Acharya, D.A. Shamblee and R.E. Davis, New Synthesis of Substituted 3-Aryl-1-naphthaldehydes, Tetrahedron, 31, 3 (1975).

J.S. Gillespie, Jr., S.P. Acharya and D.A. Shamblee, A New Synthesis of 3-Substituted 1-Methylnaphthalenes via Ring Expansion of 1-Methylindenes, J. Org. Chem., 40, 1838 (1975).

J.S. Gillespie, Jr., S.P. Acharya, D.A. Shamblee and R.E. Davis, Antimalarials. 3. 3-Substituted 1-Naphthalenemethonals, J. Med. Chem., 18, 1223 (1975).

MATEER, RICHARD A. (b. 1949) Associate Professor. B.A. 1962, Centre College, Ph.D. 1966, Tulane University. Organic Chemistry.

MYERS, WILLIAM H. (b. 1946) Assistant Professor. B.S., 1967, Houston Baptist College; Ph.D., 1972, University of Florida. *Inorganic Chemistry*. Halogenation of hindered aromatic amine boranes, characterization of trigonal boronium cations, elucidation of reaction of thiocyanate ion with amine-iodol adducts.

Myers, W. H. and Ryschkewitsch, G. E., Exchange of Deuterium for Hydrogen during the Reaction of Dimethylamine -N-d-Borane with Halogenating Agents, *Inorganic Chemistry*, *17*, 1157-1159 (1978).

D. L. DuBois, W. H. Myers, and D. W. Meek, Sunthesis of Polytertiary Phosphines and 'Mixed' Phosphorus-Sulphur and 'Mixed' Phosphorus-Nitrogen Polydentate Ligands *via* Free-Radical Catalysis, *J. Chem Soc*. (Dalton), 1011-1015 (1975).

W. H. Myers, G. E. Ryschkewitsch, M. A. Mathur, and R. W. King, Trends in the Proton Nuclear Magnetic Resonance Spectra of Some Amine-Haloboranes: Steric Effects, *Inorg. Chem.*, *14*, 2874-2881 (1975).

G. E. Ryschkewitsch and W. H. Myers, Boron Trihalide-Amine Adducts: Direct and Indirect Synthesis, *Syn. React. Inorg. Metal-Org. Chem*., *5*, 123-134 (1975).

W. H. Myers and G. E. Ryschkewitsch, Trends in the Reactivity of Mixed Phenyl-Methyl Phosphine-Boranes Towards Hydrogen Halides, *Phosphorus*, *5*, 97-99 (1975).
Grants active 1977-78: Research Grant $1544 from University of Richmond.
New grant $1250 from University of Richmond.

POWELL, W. ALLAN (b. 1921) Professor. Chairman, Department of Chemistry. B.S., 1942, Wake Forest University; Ph.D., 1953, Duke University. *Analytical Chemistry*.Instrumental methods, chemical nature of jellyfish toxin.

RYAN, SANDRA B. (B. 1943) Part-time Instructor. B.S., 1964, University of Richmond, M.S., 1978, Virginia Commonwealth University. *Organic Chemistry*.

TOPHAM, RICHARD A. (b. 1943) Associate Professor. B.S., 1965, Hampden-Sydney College; Ph.D., 1969, Cornell University. *Biochemistry*. Mechanism of iron metabolism. Eight Publications, 1973-78.

Powanda, M. E., Kenyn, R. H., Topham, R. W., Whitmire, R. E., and Hauer, E. C., Alternations in Trace Metals, Proteins, and Lipids During Rocky Mountain Spotted Fever in Guinea Pigs, *Nutrition Reports International*, *18*, 57 (1978).

*Chin, J. L., *Calisch, M. P., and Topham, R. W., Purification & Characterization of the Ferroxidase-II from Rabbit (Oryctolagus Cuniculus) Serum. *International Journal of Biochemistry*, *9*, 775 (1978).

*Lykins, L. F., *Akey, C. A., *Christian, E. G., *DuVal, G. E., and Topham, R. W., Dissociation and Reconstitution of Human Ferroxidase-II, *Biochemistry*, *16*, 693 (1977).

*Lykins, L. F., *Akey, C. A., *Christian, E. G., and Topham, R. W., Dissociation and Reconstitution of Human Ferroxidase-II, *Fed. Proc*., *35*, 1608 (1976).

Topham, R. W., Sung, SM, *Morgan, F. G., *Prince, W. D., and *Jones, S. H., Functional Significance of the Copper and Lipid Components of Ferroxidase-II. *Archives of Biochemistry and Biophysics*, *167*, 129 (1975).
Grants active in 1977-78: National Institutes of Health, two year grant $93,000.

WORSHAM, JAMES E. (b. 1925) Professor. B.S., 1947, University of Richmond; M.S., 1949, Vanderbilt University; Ph.D., 1953, Duke University. *Physical Chemistry*. Delivery of oxygen to tissue.

ROANOKE COLLEGE

Salem, VA 24153

Fall 1978 ug enrollment 1200

Degrees offered B.A., B.S.

Telephone (703) 389-2351

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 5 . 2. Support staff: FTE's secretary 0 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 10 Grad. school 4 Industry 6 Professional schools 0 Other 0 .
4. Senior majors, average past five years: 9 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 16000 % used for teaching 90 Research 10
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Varian EM-300)
MS (Varian EM-600)
IR (Beckman Acculab 1 and Perkin-Elmer 457)
UV-Vis (Coleman Hitachi ESP 3T and Beckman DU)
GC (Varian 600C and Gow-Mac 69-100)
AA (Perkin-Elmer 290)
LC (Spectra Physics 3100)
X-Ray (GE XRD-5)
Polarograph (Fisher 65)
Osmometer (Hewlett Packard 502)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 27 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 18 .

4. Computer facilities: Department - minicomputer, Digital PDP 11/10

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
Approx. $1000/yr for chemicals and glassware; $3000-$5000/yr. for equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
NSF-ISEP, $5500

3. Faculty teaching loads: Contact hours 12 Load credit for research? 0

4. Sabbatical or leave support for research: Sabbatical leave program at 50% salary for full year, or full salary for 1/2 year.

BONDURANT, CHARLES W. JR. (b. 1918) Professor. A.B., 1939, Emory and Henry College; M.S., 1950, Ph.D., 1960, Virginia Polytechnic Institute and State University. Analytical Chemistry. Chemical education.

FISHER, CHARLES H. (b. 1906) Adjunct Research Professor. B.S., 1928, Roanoke College; M.S., 1929, Ph.D., 1932, University of Illinois. Director, USDA Southern Research Laboratories, New Orleans, LA, 1950-1972. Organic Chemistry. Organic synthesis, homology.

C. H. Fisher and B. P. Huddle, Equations Relating Homolog Melting Points to Chain Length, Ind. J. Chem., in press.

HENSON, PAUL D. (b. 1937) Professor and Chairman. B.S., 1960, Roanoke College; M.S., 1962, Ph.D., 1965, Virginia Polytechnic Institute and State University. Research Associate, 1968-1969, Princeton University; 1975-1976, Medical College of Virginia - Virginia Commonwealth University. Organic Chemistry. Stereochemistry of organsphosphorus compounds, organic synthesis, bio-organic chemistry.

Paul D. Henson, Steven B. Ockrymiek,* and Raymond E. Markham, Jr.,* Reductive Cleavage of Phosphinamides with Lithium Aluminum Hydride, J. Org. Chem., 39, 2296 (1974).

HUDDLE, BENJAMIN P. (b. 1941) Associate Professor. B.S., 1963, Lenoir Rhyne College; Ph.D., 1968, University of North Carolina. Physical Chemistry. X-ray crystal structure analysis, use of computers in chemistry, homology.

C. H. Fisher and B. P. Huddle, Equations Relating Homolog Melting Points to Chain Length, Ind. J. Chem., in press.

B. P. Huddle and K. Whitmire,* Improved Victor-Meyer Apparatus, J. Chem. Educ., 54, 261 (1977).

MILLER, VERNON R. (b. 1941) Assistant Professor. B.A., 1963, Manchester College; Ph.D., 1968, Southern Illinois University. Research Associate, 1968-1970, University of Florida; 1970-1974, University of Virginia. Inorganic Chemistry. Inorganic synthesis, synthesis and catalytic properties of metalloboranes.

V. R. Miller, R. Weiss, and R. N. Grimes, Polyhedral Cobaltaboranes. Versatile Replacement of BH Groups by Co (η^5-C_5H_5) Units in Boron Hydride Frameworks. Borane-Metal Cluster Hybrid Molecules, J. Amer. Chem. Soc., 99, 5646, (1977).

V. R. Miller and R. N. Grimes, "Proton-Proton Spin Coupling in Metallocarboranes. Triple-Resonance Nuclear Magnetic Resonance Spectroscopy as a Structural Probe for Boron Compounds," Inorg. Chem., 16, 15 (1977).

W. M. Maxwell, V. R. Miller, and R. N. Grimes, "Cobalt-Hydrogen Metallocarboranes. Synthesis of Closo-$[(CH_3)_2C_2B_4H_4]_2CoH$ and Nido-Closo-$[(CH_3)_2C_2B_3H_5]CoH[(CH_3)_2C_2B_4H_4]$ and Their Conversion to New Cobalt-Cobalt Bonded Metallocarboranes," J. Amer. Chem. Soc., 98, 4818 (1976).

W. M. Maxwell, V. R. Miller, and R. N. Grimes, "Iron-Hydrogen and Iron-Cobalt Metallocarboranes. Synthesis and Chemistry of $[(CH_3)_2C_2B_4H_4]_2Fe^{II}H_2$ and a Novel Tetracarbon Carborane System, $(CH_3)_4C_4B_8H_8$," Inorg. Chem., 15, 1343 (1976).

V. R. Miller and R. N. Grimes, "Cobalt-Boron Clusters," J. Amer. Chem. Soc., 98, 1600 (1976).

Grant active 1977-1978: Research Corporation Cottrell College Science Grant, $7500. An Investigation of the Catalytic Properties of Selected Metalloboron Cluster Compounds.

OETGEN, RONALD R. (b. 1937) Associate Professor. A.B., 1960, M.S., 1962, Ph.D., 1965, Western Reserve University. Research Associate, 1965-1966, University of California (Berkeley). Organic and Biochemistry. Carbohydrate chemistry, chemical education.

ROCHESTER INSTITUTE OF TECHNOLOGY
Rochester, NY 14623

Fall 1978 ug enrollment 8200
M.S.
Degrees offered A.S., A.A.S., B.S.
Telephone (716) 475-2497

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 15 . 2. Support staff: FTE's secretary 1 Stockrm 7 Technician 1
3. 1978 seniors & their placement: Total 12 Grad. school 4 Industry 7 . Professional schools 1 Other ____.
4. Senior majors, average past five years: 18 .
5. Students involved in research, average past five years: Acad. yr. 12 -Summer (CO-OP)
6. National student honors, past five years (NSF fellowships, etc.)
   One NSF Graduate Fellowship - 1977

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 21,000 % used for teaching 65 Research 35
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   NMR (Varian CFT-20 and P.E.-R20)
   IR (P.E. 621, Beckman IR-8, P.E. 137 and 257)
   U.V.-vis. (P.E.-450, Carey -219
   HPLC-Waters
   GC (2-Varian 1520, P.E.-800, Beckman GC2a)
   AA (P.E.-303)
   Rqman (Spex-Spectra Physics -SSR)
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 70 Computer literature search service? NO Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 25 .
4. Computer facilities: Campus: Xerox Sigma 9 Computer
   Department: Minicomputer (Varian 620i); DEC-PDP11/V03

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $15,000 /yr. for chemicals and glassware; $15,000/yr. for equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   None
3. Faculty teaching loads: Contact hours 11 Load credit for research? YES
4. Sabbatical or leave support for research:
   Faculty can apply for sabbatical leave at 50% salary for full year, full salary for one quarter.

FACULTY PROFILE

ADDUCI, JERRY M. (b. 1934) Assistant Professor, B.S., 1957, University of Rochester, Ph.D., 1963, University of Pennsylvania. Organic Chemistry. Aliphatic mechanisms and polymer synthesis.

R. S. Ramirez, S. K. Sikka and J. M. Adduci, Thermally Stable Sulfone-Containing Poly (Amide-Imides), J. Polymer Sci., 11, 1321 (1973).

G. Fague*, G. Friends* and J. M. Adduci, Sulfone-Containing Polyamide, Polymer Preprints, 14 (2), 1306 (1973).

S. K. Sikka and J. M. Adduci, Sulfone-Containing Poly (Amide-Imides), Macromolecular Syntheses, Vol. 7, xxx (1978).

BIGLER, WILLIAM N. (b. 1937) Associate Professor, M.S., 1963, San Jose State College, Ph.D., 1968, University of Colorado, Boulder. Biochemistry. Regulatory enzymes, radiation sensitivity and metabolic control.

W. N. Bigler and B. M. Tolbert, Sedimentation and Subunit Interactions of Gamma-Irradiated Solid Aspartate Transcarbamylase, Radiation Res., 72, 384 (1977).

FREY, JAMES E. (b. 1946) Assistant Professor, B.S., 1967, Lehigh University, Ph.D., 1972, Lehigh University. Analytical-Inorganic Chemistry. High pressure liquid chromatography, transition metal complexes, Carbon-13 NMR.

Research Corporation Grant: "Structure, ^{13}C NMR Spectra and Metal Complexes of Benzoselenadiazole", $7,000 (1978).

GILMAN, ROBERT E. (b. 1932) Professor and Department Head. A.B. Dartmouth College, 1954, M.S. Organic Chemistry, University of Michigan, 1957, Ph.D., 1959, University of Michigan. Organic Chemistry. Organic synthesis in cyclophane, thiophene and xanthate systems.

HAYLES, WILLIAM J. (b. 1927) Professor, B.A., Wesleyan University, 1950, Ph.D., Chemistry, Iowa State University, 1958. Analytical Chemistry. Interfacing computers and instruments for experimental control and data treatment.

HILBORN, DAVID A. (b. 1945) Assistant Professor, B.S., 1967, Lafayette College, Ph.D., 1973, Cornell University. Biochemistry and Physical Chemistry. Control of growth of cells, protein structure and functions.

D. A. Hilborn, Serum Stimulation of Phosphate Uptake into 3T3 Cells, J. Cell Physiol., 87:111. (1976).

I. S. Trowbridge, and D. A. Hilborn, Effects of Succinyl-Con A on the Growth of Normal and Transformed Cells. Nature, 250:304, (1974).

D. A. Hilborn, and G. G. Hammes, Equilibrium Binding of Nucleotides to Beef Heart Mitochondrial ATPase. Biochemistry, 12:983. (1973).

LIPPERT, JOSEPH L. (b. 1944) Associate Professor, B.S., 1966, South Dakota School of Mines and Technology, Ph.D., 1970, University of Colorado. Physical Chemistry. Raman spectroscopy; biophysics; conformational dynamics of biomembranes; lipid-protein interactions.

M. W. Hanna and J. L. Lippert, Theory of the Ground State Structure of Molecular Complexes, in Molecular Complexes, Roy Foster, ed., Logos Press, London, 1973, p.1.

LIPPERT, JOSEPH L., cont'd

T-J. Yu, J. L. Lippert and W. L. Peticolas, Laser Raman Studies of Conformational Variations of Poly-L-Lysine, Biopolymers, 12, 2161 (1973).

J. L. Lippert, L. E. Gorczyca* and B. Meiklejohn*, A Laser Raman Spectroscopic Investigation of Phospholipid and Protein Configurations in Hemoglobin-Free Erythrocyte Ghosts, Biochim. Biophys. Acta, 382, 51 (1975).

NIH Research Grant, "Raman Spectral Studies of Lipid-Protein Interactions in Biomembranes", $62,200 (1977-79).

MORRILL, TERENCE C. (b. 1940) Professor, B.S., 1961, Syracuse University, M.S., 1964, CSU-San Jose, Ph.D., 1966, University of Colorado. Organic Chemistry. Organic reaction mechanisms; lanthanide shift reagents for NMR.

T. C. Morrill, R. Opitz*, L. Replogle, K. Katsumoto, W. Schroeder, and B. A. Hess, Jr., Correspondence Between Theoretically Predicted and Experimentally Observed Sites of Electrophilic Substitution on a Fused Tricyclic Heteroaromatic (Azulene) System, Tetrahedron Letters, 2077, (1975).

T. C. Morrill, and A. R. Bayley*, Improved Synthesis of Picrylhydrazine and of the Picrylhydrazones of Acetone and of Acetaldehyde, Organic Preparations and Procedures Int., 7, 67 (1975).

T. C. Morrill, R. A. Clark, D. Bilobran*, and D. S. Youngs, New Dimensions in Lanthanide Shift Reagent - PMR Analysis of Organic Compounds: Eu(tfn)$_3$, Tetrahedron Letters, 397 (1975).

R. M. Silverstein, G. C. Bassler, and T. C. Morrill, Spectrometric Identification of Organic Compounds, Wiley, 3rd edition, 1974.

TAKACS, GERALD A. (b. 1943) Assistant Professor, B.S., 1965, University of Alberta-Edmonton, Ph.D., 1971, University of Wisconsin. Physical Chemistry. Atmospheric chemistry; combustion chemistry; photochemistry; mass spectrometry.

A. J. Illies and G. A. Takacs, Gas Phase Ultra-Violet Photoabsorption Cross Sections for Nitrosyl Chloride and Nitryl Chloride, J. Photochem., 6, 35 (1976).

A. P. Uthman*, G. A. Sherman* and G. A. Takacs, Photoabsorption Spectrum of Gaseous Nitryl Fluoride, Spectrochimica Acta A, (in press)

A. P. Uthman*, P. J. Demlein*, T. D. Allston*, M. C. Withiam*, M. J. McClements and G. A. Takacs, Photoabsorption Spectra of Gaseous CH_3Br, $BrCH_2CH_2Br$, BrNO, $SOCl_2$, and SO_2Cl_2, J. Phys. Chem., (in press)

Manufacturing Chemists Research Grant,"Photoabsorption Cross-Sections of Some Sulphur and Halogen Containing Compounds of Atmospheric Interest",$18,000, 1978-79.

Research Corporation Grant, "Gas Phase Photoabsorption Cross-Sections For Some Nitrogen Oxyhalides", $5,500, 1977-78.

VANANTWERP, CRAIG L. (b. 1950) Visiting Assistant Professor, B.S., 1972, Juniata College, Ph.D., 1978, Stanford University, Organic Chemistry. Carbon-13 NMR as a probe for molecular structure determination.

H. Eggert, C. L. VanAntwerp, N. S. Bhacca, and C. Djerassi, Carbon-13 Nuclear Magnetic Resonance Spectra of Hydroxy Steriods, J. Org. Chem., 41-71, (1976).

2

ROLLINS COLLEGE

Winter Park, FL 32789

Fall 1978 ug enrollment 1250

Degrees offered B.A.

Telephone (305)-646-2000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2. Support staff: FTE's secretary 1 Stockrm 3/4 Technician 1/3
3. 1978 seniors & their placement: Total 5 Grad. school 1 Industry 3 Professional schools 1 Other ________.
4. Senior majors, average past five years: 3.5 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 1-1/2
6. National student honors, past five years (NSF fellowships, etc.)

Jay Grate-NSF Graduate Fellow, Univ. of California, San Diego 1978

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 19,000 % used for teaching 85% Research 15%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (T-60)
Liquid Chromatograph (Altec)
Mass Spectrometer (Finigan)
Atomic Absorption (P.E.)
X-Ray Diffraction (G.E.)
IR (Beckman, P.E., Hilger-Watts)
Gas Chromatograph (Varian, 3)
Differential Pulse Polarograph (Princeton Applied Research)
UV-Vis (Cary 15)
Stopped Flow Kinetics (Aminco)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 19 Computer literature search service? Yes 1977-78 Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 11 .

4. Computer facilities: DEC PDP-11-40 with disk storage, magnetic and high-speed paper tape. 10 CRT's, 7 teletype, 3 DEC LA36, lineprinter and 2 Tektronix graphics terminals Offices equipped with ports and two terminals assigned to department.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: No seperate budget.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
None

3. Faculty teaching loads: Contact hours 12 Load credit for research? No

4. Sabbatical or leave support for research:
Faculty can apply for leaves every five years. Full salary for 1/2 year, 1/2 salary for full year.

BLOSSEY, ERICH C. (b. 1935) Professor. B.S., 1957 Ohio State University; M.S., 1959, Iowa State University; Ph.D., 1963, Carnegie-Mellon University. Bioorganic Chemistry. Solid phase synthesis and polymer-bound reagents.
8 Publications - 1973 - 1978.

E.C. Blossey, Solid Phase Synthesis, Benchmarck Series, Dowden Hutchinson and Ross, Inc. Co-editor with D.C. Neckers, 1975.

E.C. Blossey, PSI Study Guide to Organic Chemistry, John Wiley and Sons, Inc. 1976.

D.C. Neckers, M.P. Doyle, and E.C. Blossey, Solutions Manual to Organic Chemistry, John Wiley and Sons, Inc., 1976.

E.C. Blossey, L.M. Turner, and D.C. Neckers, Polymer-Protected Reagents. III. Acetal Formation with Polymer-Protected Aluminum Chloride. J. Org. Chem., 40, 959 (1975).

A.P. Schaap, A.L. Thayer, E.C. Blossey, and D.C. Neckers. Polymer-Based Sensitizers for Photooxidations II. J. Am. Chem. Soc., 97, 3741 (1975).

COE, DOUGLAS A. (b. 1947) Visiting Assistant Professor. B.S. 1969, Montana State University, Ph.D., 1974, Oregon State University. Physical Chemistry, Spectroscopy of conformational isomers, reactive species, and linkage isomers.

Seven publications (1973 - 1978)

J.M. Shreeve and D.A. Coe, Vibrational Studies of CF_3SF_3 and $(CF_3)_2SF_2$, Spectrochim. Acta, 34A, 1 (1978).

D.A. Coe, R.S. Pyron, *M.K. Parpart, and W.C. Harris, Vibrational Spectra and Structure of 4-chloro-1,2-butadiene, J. Phy. Chem., 81, 952 (1977).

W.C. Harris, D.A. Coe, W.C. Pringle and *J.K. Snow, Interpretation of Vibrational Spectra of Small Ring Systems: Matrix Isolation Studies and Potential Function for Perfluorocyclobutane, J. Mol. Spec., 62, 149 (1976).

W.O. George, D.A. Coe, and W.C. Harris, Vibrational Spectra and Structure of Esters - II. Raman Spectra and Potential Function Calculations for $HCOOCH_3$, $DCOOCH_3$ and $HCOOCD_3$, Spectrochim. Acta, 32A, 1 (1976).

D.A. Coe, J.W. Nibler, T.H. Cook, D. Drew, and G.L. Morgan, Vibrational Spectra of Cyclopentadienylberyllium Borohydride, J. Chem. Phys., 63, 4842 (1975).

HELLWEGE, HERBERT E. (b. 1921), Ph.D., 1953 University of Hamburg. Physical Chemistry. Equilibria constants of coordination compounds. Solvent extraction. Thermodynamic properties of organic-aqueous solvents.

RIDGWAY, ROBERT W. (b. 1939) Associate Professor and Department Chairman. B.S., 1966, Drexel Institute of Technology, Ph.D., 1970, University of New Hampshire. Organic Chemistry. Physical Organic chemistry, Stereochemistry, Computers in Chemical Education.

J.D. Morrison and R.W. Ridgway, Reduction of Phenyl Trifluoromethyl ketone with Halomagnesium Alkoxides, An Almost Irreversible Meerwein-Ponndorf-Verley Type System, J. Org. Chem., 39, 3107 (1974).

S.P. Chang, R.W. Ridgway and G.R. Riser, Oligomeric Plasticizers from Crambe Oil-Derived Dicarboxylic Acids for Poly-(vinyl chloride), J. Amer. Oil. Chem. Soc., 52, 10 (1975).

R.W. Ridgway, H.S. Greenside, and H.H. Freedman, Cocatalysis of Phenolate Phosphorylation in Biphasic Media, J. Amer. Chem. Soc., 98, 1979 (1976).

S.P. Chang and R.W. Ridgway, Oligomeric Polyesters from Long-Chain Dicarboxylic Acids as Plasticizers for Vinyl Polymers, U.S. Patent 4,029,627, Issued June, 1977.

SAINT JOHN'S UNIVERSITY

Collegeville, MN 56321
COLLEGE OF SAINT BENEDICT

St. Joseph, MN 56374
(Joint Department)

Fall 1978 ug enrollment 3445 (comb.)

Degrees offered B.S., B.A.

Telephone (612) 363-3465

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2. Support staff: FTE's secretary 0.25 Stockrm 0 Technician 0
3. 1978 seniors & their placement: Total 10 Grad. school 6 Industry 2 Professional schools 2 Other 0 .
4. Senior majors, average past five years: 11 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

NONE

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 15,000 % used for teaching 85% Research 15%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - VARIAN (EM 360)
NQR - WILKS (1A)
CALORIMETER - GUILD (400)
AA - PE (360)
GC - PE (820)
IR - PE (257)

3. Library resources: Chem. abstracts? YES Volume indices? YES Collected indices? NO Total journal subscriptions? 21 Computer literature search service? (MINITEX) Separate chemistry or science library? NO Librarian? NO Standing orders for review series and annual reviews (past five years) 4 .

4. Computer facilities: Department: CRT (NCR-796-101), DIGITAL (LA36 DECWRITER II).
Campus: HP 2000, DEC 11V03 (DECLAB), HARRIS/4.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approx. $2,000/yr. chemicals and glassware; $1,500/yr. for equipment

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

NONE

3. Faculty teaching loads: Contact hours 13 Load credit for research? occasionally

4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary for a full year or full salary for 1/2 year. Seven year waiting period between successive sabbaticals.

FULTON, ROBERT B., (b. 1942) Associate Professor and Chairman. B.A., 1964, University of Minnesota-Duluth, Ph.D., 1968, University of Minnesota. Analytical Chemistry. Development of Ion Selective Spectrophotometric methods for the analysis of "free" metal ions in biological fluids.

HUGHES, MARK B., (b. 1931) Professor. B.A., 1953, Saint John's University, Ph.D., 1958, Iowa State University. Organic Chemistry.

JOCHMAN, RICHARD L., (b. 1948) Instructor. B.S., 1970, St. Norbert College, M.S., 1974, University of Kansas, Ph.D., 1978, University of Kansas. Medicinal Chemistry. Synthesis of metabolically stable analogs of brain peptides.

LAROCHELLE, JOHN H., (b. 1947) Instructor. B.S., 1969, University of New Hampshire, Ph.D., 1977, Iowa State University. Analytical Chemistry. Electro-analytical chemistry.

J.H. Larochelle and D. C. Johnson, Chromatographic Determination of Chromium (VI) with Coulometric Detection Based on the Electrocatalysis by Adsorbed Iodine of the Reduction at Platinum Electrodes in Acidic Solution, Anal. Chem, 50, 240(1978).

Richard W. Andrews, John H. Larochelle, and Dennis C. Johnson, Determination of Trace Mercury (II) in 0.1M Perchloric Acid by Differential Pulse Stripping Voltammetry at a Rotating Gold Disc Electrode, Anal. Chem., 48, 212(1976).

Dennis C. Johnson and John H. Larochelle, Forced-Flow Liquid Chromatography with a Coulometric Detector, Talanta, 20, 959(1973).

NEFT, SISTER NIVARD, (b. 1922) Associate Professor. B.S., 1946, College of St. Benedict, Ph.D., 1971, Utah State University, Biochemistry. Inhibition of mitochondrial electron transport system by analogs of antimycin A; biosynthesis of antimycin A.

J.Sesney, S.N.Neft and R. Stringham, The Development of an Integrated Science Core Curriculum for Allied Health Students. J. of Allied Health, 6, 34(1977).

RIOUX, FRANK J., (b. 1942) Associate Professor. B.A., 1964, Bradley University, M.S., 1967, Iowa State University, Ph.D., 1969, Iowa State University, Physical Chemistry. Application of series solution approach to quantum mechanical problems; one-dimensional quantum mechanical calculations for undergraduates.

F. Rioux, Colligative Properties, J. Chem. Educ., 50, 490(1973).

F. Rioux, The Stability of the Hydrogen Atom, J. Chem. Educ., 50, 550(1973).

F. Rioux and P. Kroger*, Charge Cloud Study of Atomic and Molecular Structure, Amer. J. Phys., 44, 56(1976).

F. Rioux, Simple Calculation of the Lattice Energy of Lithium Hydride, J. Chem. Educ., 54, 555(1977).

SCHOMER, SISTER CARLEEN, (b. 1941) Instructor. B.A., 1966, College of St. Benedict, M.S., 1973, Marquette University. Inorganic Chemistry.

WULFSBERG, GARY P., (b. 1944) Assistant Professor. B.S., 1966, Iowa State University, Ph.D., 1971, University of Wisconsin. Inorganic and Organometallic Chemistry. Metal derivatives of chlorocarbons, nuclear quadrupole resonance (NQR) spectroscopy, coordination chemistry of poly- and crown ethers.

Seven publications, 1973-1978.

G. Wulfsberg, R.J.C. Brown, *J. Graves, *D. Essig, *T. Bonner, and M. Lorber, Halogen-Metal Secondary Bonding. II. A Variable-Temperature and -Pressure NQR Study of Inter- versus Intramolecular Secondary Bonding in Mercury Derivatives of Chlorocarbons, Inorg. Chem., 17, 3426 (1978).

G. Wulfsberg, *J. Graves, *J. Griffiths, *D. Essig, and R.J.C. Brown, Chlorine-Mercury Interactions in Mercury Derivatives of Poly-Chlorinated Phenols and Other Chlorocarbons, in M.V. Kennedy, ed., Disposal and Decontamination of Pesticides (A.C.S. Symposium Series #73), American Chemical Society, Washington, 1978, p. 145.

G. Wulfsberg and A. Weiss, Crown Ether Size Effects, Effective Matrix Isolation of Metal Halide, Ligand Conformation, and Halogen Bridging in Cadmium Halide-Polyether Adducts. A Nuclear Quadrupole Resonance, Infrared, and Raman Study, J.C.S. Dalton Trans., 1640(1977).

G. Wulfsberg, Information on Structure and Basicity from the Nuclear Quadrupole and Infrared Spectra of Mercury Halide Adducts of Polyethers and a Crown Ether, Inorg. Chem., 15, 1791(1976).

G. Wulfsberg, R. West, and V.N.M. Rao, ^{35}Cl NQR as a Method of Detecting Chlorine-Metal Coordination in Organomercury Derivatives of Chlorocarbons, J. Organometal. Chem., 86, 303(1975).

Grants active 1977-78: Research Corporation Cottrell College Science Grant, \$4,000, ^{35}Cl NQR as a Means of Distinguishing Inter- and Intramolecular Coordination in Chlorinated Organometallic Compounds.

SAINT OLAF COLLEGE

Northfield, MN 55057

Fall 1978 ug enrollment 2950

Degrees offered B. A.

Telephone (507) 663-3104

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 7.67. 2. Support staff: FTE's secretary 1 Stockrm 1 Technician .25
3. 1978 seniors & their placement: Total 39 Grad. school 7 Industry 2
   Professional schools 18 Other 12 .
4. Senior majors, average past five years: 40 .
5. Students involved in research, average past five years: Acad. yr. 7 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

   NSF Winner, John Sehaus, 1975

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 30,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR (JOEL Model C60-HL)
   UV-Vis (Cary Model 17)
   AA (P-E Model 303)
   IR (P-E Model
   GC (Varian-Aerograph, Model 200)
   Electrochem (Beckman Electroscan 30)
   Ultracentrifuge (Beckman Model L2-50)
   X-Ray Diffraction (Philips/Norelco)
   Spectrofluorometer (Aminco-Bowman)
   Liquid Scintillation System
   (Beckman Model LS-100C)
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes
   Total journal subscriptions? 26 Computer literature search service? yes
   Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 15 .
4. Computer facilities: Department: Minicomputer, PDP11/10 with PC 11 tape reader/punch three video and one printing (DECWRITER II) terminal.
   Campus: PDP 11/40 time-shared and IBM 1130 batch system.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   Highly variable but department has responded to need (approximately $2000-4000/yr.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Johnson's Wax, $2000; E. I. DuPont, $6500; NSF (LOCI), $18,000; NSF (URP), $10,700
3. Faculty teaching loads: Contact hours 12 Load credit for research? variable
4. Sabbatical or leave support for research:

   Faculty eligible for leave at 50% salary for full year and full salary for one-half year. Eligible every seventh year.

FACULTY PROFILE

BRAINARD, BRADLEY J. (b. 1955) Instructor. B. A., 1978, St. Olaf College. *Biochemistry*. Inhibitor studies of the fibrinogen binding site on thrombin.

HANSON, ALLEN L. (b. 1915) Professor. B. A., 1935, Concordia College, Ph. D., 1942, University of Iowa. *Physical Chemistry*. Gamma radiation of Alkyl Halides, Inhibition of Elastase enzyme reactions, Quanching in flash photolysis reactions.

HARDGROVE, GEORGE L. JR. (b. 1933) Professor. A. B., 1956, Oberlin College, Ph. D., 1959, University of California (Berkeley) *Physical Chemistry*. Molecular Structure studies by X-ray diffraction and nuclear magnetic resonance.

G. L. Hardgrove, Mary M. Lien* and J. Stuart Bratholdt*, The Crystal Structure of *cis*-1,2-diphenylthietane-*trans*-1-oxide, *J. Org. Chem.*, *39*, 246 (1974).

HENDRICKSON, H. STEWART (b. 1937) Associate Professor. B. A., 1959, Pomona College, Ph. D., 1962, University of Illinois. *Biochemistry*. Membrane biochemistry; surface properties of lipids; lipolytic enzymes.

C. Willman and H. S. Hendrickson, Positive Surface Charge Inhibition of Phospholipase A$_2$ in Mixed Monolayers, *Arch. Biochem. Biophys.*, 191,298 (1978).

H. S. Hendrickson and M. C. E. van Dam-Mieras, Local Anesthetic Inhibition of Pancreatic Phospholipase A$_2$ Action on Lecithin Monolayers, *J. Lipid Res.*, *17*, 399 (1976).

H. S. Hendrickson, The Penetration of Local Anesthetics into Phosphatidyl Choline Monolayers, *J. Lipid. Res.*, *17*, 393 (1976).

H. S. Hendrickson, D. G. Rustad*, E. M. Scattergood, and D. E. Engle*, The Action of Phospholipase C and Lipase on Black Film Bilayer Membranes, *Phys. Chem. Lipids*, *13*, 63 (1974).

Grants Active 1977-78: NIH Research Grant, $15,000; NSF Equipment Grant, $7,600.

MARSHALL, JOHN C. (b. 1935) Professor. B. A., 1956, Luther College, Ph. D., 1960, State University of Iowa. *Analytical Chemistry*. Flame Spectroscopy, Computer Applications in Chemistry, File Searching.

S. Lowry, T. L. Isenhour and J. C. Marshall, Compt in Chem. *1*, 1 (1975).

H. D. Orr, J. C. Marshall, T. L. Isenhour and P. C. Jurs, Computer Programming for Biological Scientists, Allyn and Bacon (1973), 396 pages.

H. Clark, J. C. Marshall, T. L. Isenhour, J. Chem. Ed. *50*, 645 (1973).

Grants Active 1977-78: NSF (LOCI), Project Director, $18,000.

ST. OLAF COLLEGE

MIESSLER, GARY L. (b. 1949) Instructor. B. S., 1970, University of Tulsa, Ph. D., 1978, University of Minnesota. *Inorganic Chemistry*. Synthesis and photochemistry of transition metal complexes.

S. H. Wheeler, B. M. Mattson, G. L. Miessler, and L. H. Pignolet, Electrochemical and chemical properties of dithiocarbamato complexes of ruthenium (II), ruthenium (III), and ruthenium (IV), *Inorg. Chem.*, *17*, 340 (1978).

K. W. Given, B. M. Mattson, M. F. McGuiggan, G. L. Miessler, and L. H. Pignolet, Photochemical reaction pathways of ruthenium (III) complexes. Ultraviolet irradiation of tris (N,N-dialkyldithiocarbamato) ruthenium (III), *J. Am. Chem. Soc.*, *99*, 4855 (1977).

K. W. Given, B. M. Mattson, G. L. Miessler, and L. H. Pignolet, Mass spectrometry data for tris- and bis (N,N-dialkyldithiocarbamato) complexes of chromium, iron, cobalt, ruthenium, rhodium, and thallium, *J. Inorg. Nucl. Chem.*, *39*, 1309 (1977).

G. L. Miessler, G. Stuk, T. P. Smith, K. W. Given, M. C. Palazzotto, and L. H. Pignolet, Photochemistry of dithiocarbamato complexes. I. Photolysis in chlorine-containing solvents, *Inorg. Chem.*, *15*, 1982 (1976).

PEARSON, WESLEY A. (b. 1932) Professor. B. A., 1954, St. Olaf College; Ph. D., 1958, University of Minnesota. *Organic Chemistry*. Reaction mechanisms and stereochemistry.

W. A. Pearson and A. E. Finholt, An Integrated Synthesis Laboratory for the Sophomore Year, *J. Chem. Educ.*, *52*, 236 (1975).

W. A. Pearson and G. O. Spessard, α- and β-D-Glucose Pentaacetate: An Experiment in Structure Assignment using NMR, *J. Chem. Educ.*, *52*, 814 (1975).

SPESSARD, GARY O. (b. 1944) Assistant Professor. B. S., 1966, Harvey Mudd College; M. S., 1968, University of Wisconsin; Ph. D., 1970, Wesleyan University. *Organic Chemistry*. Synthesis and biosynthesis of terpenes. Synthesis of pepper alkaloids.

Gary O. Spessard, Wan Kit Chan, and S. Masamune, Preparation of Thiol Esters, *Org. Syn.*, *58*, in press.

Wan Kit Chan, S. Masamune, and Gary O. Spessard, Preparation of O-Esters from the Corresponding Thiol Esters, *Org. Syn.*, *58*, in press.

Wesley Pearson and Gary O. Spessard, α- and β-D-Glucose Pentaacetate: An Experiment in Structure Assignment Using NMR, *J. Chem. Ed.*, 52, 814 (1975).

S. Masamune, C. U. Kim, K. E. Wilson, G. O. Spessard, P. E. Georghiu, and G. S. Bates, Synthesis of Macrolide Antibiotics. I. Methymycin, *J. Am. Chem. Soc.*, *97*, 3512 (1975).

Grants active 1978: Research Corporation Cottrell College Science Grant: A Study of Farnesol Cyclization, $6200.

TARR, DONALD A. (b. 1932) Associate Professor. B. A., 1954, Doane College, M. S., 1956, Ph. D., 1959, Yale University. *Inorganic and Physical Chemistry*. Kinetics and Mechanisms of coordination reactions; coordination compounds; equilibria, kinetics, and mechanisms of coordination reactions, optically active compounds.

R. D. Gillard and D. A. Tarr, New Optically Active Metal Ions, *Inorg. Chim. Acta*, *12*, L32 (1975).

R. D. Gillard, D. J. Shepherd, and D. A. Tarr, Circular Dichroism of Labile Trioxalatometallate (III) compounds, *J. Chem. Soc. (Dalton)*, 594 (1976).

UNIVERSITY OF SANTA CLARA
Santa Clara, CA 95053

Fall 1978 ug enrollment 3600
Degrees offered B.S.
Telephone (408) 984-4299

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6.9. 2.Support staff: FTE's secretary 0.5 Stockrm 0.7 Technician 1.2
3. 1978 seniors & their placement: Total 24 Grad. school 8 Industry 13 Professional schools 2 Other 1.
4. Senior majors, average past five years: 19.
5. Students involved in research, average past five years: Acad. yr. 13 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 12,000 % used for teaching 50 (labs) Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)
   NMR(Varian EM-360); UV-Visible(Beckman DBGT); 3IR(Beckman IR-8, 2 Perkin-Elmer 700); several Spectronic-20's; 5 gas chromatographs (Norelco WG-PYE, F&M 700; F&M 400; 2 Gow-Mac 69-100); Gouy magnetic susceptibility; polarograph (Sargent Model III); 2 oscilloscopes (HP 1205A); modular instrument (McKee-Pederson 1000); atomic absorption spectrometer (Perkin-Elmer 303);...
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 75 Computer literature search service? no Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 55.
4. Computer facilities:
   Hewlett-Packard 2100 (used by several departments)

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Equivalent of 0.7 professor; use of labs and equipment; a few thousand dollars for new equipment; travel for profs; a Dean who cares.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 10.6 Load credit for research? plus up to 7% of annual load
4. Sabbatical or leave support for research:
   Sabbatical leave (50% full year; 83% two terms; 100% one term). Available after 6 consecutive years of full-time service.

FACULTY PROFILE

DECK, Joseph F. (b.1907) Professor. A.B., 1928, St. Louis University, M.S., 1930, St. Louis University, Ph.D., 1932, University of Kansas. *Organic Chemistry*. Heterocyclic chemistry; solid free radicals; organic synthesis.

W. T. Duffy, D. L. Strandburg, and J. F. Deck, *J. Chem. Phys. 68*, 2097-2104 (1978).

J. F. Deck, The Elements, U.S.C. Press (1978).

J. F. Deck, Chemistry of Everyday Living, Lansford Publ. Co. (1974).

NATHAN, Lawrence C. (b.1944) Associate Professor. B.A., 1966, Linfield College, Ph.D., 1971, University of Utah. *Inorganic Chemistry*. Structure of complex ions; instrumental techniques; computers.

Eight publications.

L. C. Nathan and R. O. Ragsdale, Trends in the Nitrogen-Oxygen Stretching Frequency of 4-Substituted Pyridine N-Oxide Coordination Compounds, *Inorg. Chim. Acta 10*, 177-181 (1974).

*M. J. Bigley, K. J. Radigan, and L. C. Nathan, Aliphatic Di-N-Oxide Complexes; Cobalt(II), Nickel(II), and Chromium(III) Perchlorate Complexes of N,N,N',N'-Tetramethylethylenediamine-N,N'-Dioxide, *Inorg. Chim. Acta 16*, 209-212 (1976).

L. C. Nathan, J. Cullen, and R. O. Ragsdale, Decomposition Studies of Amine N-Oxide Manganese(II) Complexes, *Inorg. and Nuclear Chem. Letters 12*, 137-140 (1976).

*J. J. MacDougall, L. C. Nathan, and J. H. Nelson, 4-Substituted Quinoline M-Oxide Complexes of Copper(II) Acetate, *Inorg. Chim. Acta 17*, 243-246 (1976).

*S. H. Wheeler, S. C. Zingheim, and L. C. Nathan, Preparation and Characterization of Some Mixed Ligand Complexes; Bispicolinatocobalt(II) and -nickel(II) with Heterocyclic Amines, *J. of Inorg. and Nuclear Chemistry 40*, 779-783 (1978).

PFEIFFER, Robert J. (b.1930) Associate Professor. B.S., 1953, University of Santa Clara, Ph.D., 1958, Cornell University. *Organic Chemistry*. Natural products; photochemistry; physical organic chemistry.

No publications since 1973.

ROSENTHAL, Lois C. (b.1946) Assistant Professor. Ph.D., June 1975, University of California, Berkeley. *Physical Chemistry*. Raman spectra; quantum chemistry; computers.

L. C. Rosenthal and H. L. Strauss, Rotational Correlation in Chloroform, *Journal of Chemical Physics*, *64*, 282(1976).

J. S. Anderson, W. E. Vaughan, L. C. Rosenthal, H. L. Strauss, Comment on Rotational Correlation in Chloroform, *Journal of Chemical Physics 65*, 2482 (1976).

SHEEHAN, William F. (b.1926) Professor and Chairman. B.S.(Honors), June, 1948, Loyola University of Chicago, Ph.D., June 1952, California Institute of Technology. *Physical Chemistry*. Dissociation energies; valence state theory; structural chemistry.

W. F. Sheehan, Periodic Table with Emphasis, *Chemistry 49*, No. 3, pp 17-18, April, 1976. (This type of periodic table was copyrighted by W.F.S. in 1970.)

W. F. Sheehan, Dissociation Energies, Electron Affinities, and Electronegativities of Diatomic Molecules: An Empirical Correlation with Predictions for XY, XY^+, XY^-, *J. Am. Chem. Soc. 100*, 1348 (1978).

SWEENEY, Michael A. (b.1931) Associate Professor. B.S., 1953, Loyola University-Los Angeles, M.S., 1955, University of California (Berkeley), Ph.D., 1967, University of California (Berkeley). Radiation Chemistry; Analytical Chemistry. Origin of life, radiation chemistry; fuel combustion.

M. A. Sweeney, A. P. Toste, and Cyril Ponnamperuma, Formation of Amino Acids by Cobalt-60 Irradiation of Aqueous Hydrogen Cyanide Solutions, Origin of Life 7, 187 (1976).

Various NASA-Ames Grants.

WHITE, David H. (b.1945) Assistant Professor. B.S., 1967, Michigan State University, Ph.D., 1972, California Institute of Technology. Organic Chemistry; Biochemistry. Synthesis of hydrocarbons; reaction mechanisms; polynucleotides.

No publications since 1973.

Consortium Interchange Agreement, Ames Research Center (NASA), 1976-1977 and 1977-1978.

SEATTLE PACIFIC COLLEGE

Seattle, WA 98119

Fall 1978 ug enrollment 2048

Degrees offered B.A. and B.S.

Telephone (206) 281-2103
(206) 281-2140(secretary)

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 3.8. 2. Support staff: FTE's secretary 0.4 Stockrm 0.4 Technician 0
3. 1978 seniors & their placement: Total 8 Grad. school 1 Industry ____ Professional schools 3 Other or unknown 4.
4. Senior majors, average past five years: 9.
5. Students involved in research, average past five years: Acad. yr. 5 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

None.

Facility, Library and Equipment Base

Science and Math

1. Bldg. space: Ft^2 *ca. 50,000* % used for teaching *98%* Research *2%*
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (Varian Anaspect EM 300)
MS (Varian Anaspect EM 600)
IR (Beckman 8)
two UV-vis (Beckman D B-G)
AA (Beckman)
GC (Aerograph A90-P3)
Refrigerated centrifuge (Sorval RC 2-B)
Scintillation counter and Pulse height analyzer (Tracor Northern TN 1705)

3. Library resources: Chem. abstracts? *to Jan. 1974* Volume indices? *to 1973* Collected indices? *No* Total journal subscriptions? *14* Computer literature search service? *access U.WA.* Separate chemistry or science library? *No* Librarian? *Yes* Standing orders for review series and annual reviews (past five years) *8*.

4. Computer facilities: *PDP 11/50 with 20 terminals available to students plus a Tekronix 4051 Graphics Unit.*

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: *ca $200 for student projects; up to ca $600 for faculty projects. Internal support for professional travel: ca $600*

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

3. Faculty teaching loads: Contact hours 12 Load credit for research? *no*

4. Sabbatical or leave support for research: *One quarter sabbatical at full salary/7 years service; longer periods for sabbatical are allowed at reduced salary; (1/2 salary for two quarters. 1/3 salary for three quarters) Leaves for research have been granted.*

FACULTY PROFILE

CAPP, GRAYSON (b. 1936) Professor. B.S., 1958, Seattle Pacific College; M.S., 1967, University of Oregon; Ph.D., 1966, University of Oregon; National Institute of Health Post-doctoral Fellow, 1966-8, Duke University. Biochemistry.

LEPSE, PAUL A. (b.1937) Professor. B.S., 1958, Seattle Pacific College; Ph.D., 1962, University of Washington; N.S.F. Postdoctoral Fellow, 1962, University of Munich. Organic Chemistry. Mechanisms of oxidation reactions, organic synthesis, computer assisted instruction in chemistry.

LINGREN, WESLEY E. (b.1930) Professor. B.S.,1952, Seattle Pacific College; M.S., 1954, University of Washington; Ph.D., 1962, University of Washington; Postdoctoral Fellow, 1967-68, Yale University. Analytical Chemistry. Electroanalytical chemistry, radiological studies of complex ions, methods of integrating science and values in the liberal arts curriculum.

W.E. Lingren, and B.D. Dietzman, J. College Sci. Teaching, 1, 52 (1975).

W.E. Lingren, Inorganic Nomenclature, A Programmed Approach, Prentice-Hall, in press.

NORMAN, ANDREA H. (b.1946) Associate Professor and Chairperson. B.A., 1969, Rice University; Ph.D., 1972, Tufts University; Postdoctoral Fellow, Spring 1973, University of Washington. Inorganic Chemistry. Synthesis of polyhedral hydroborate derivatives and oxidatively coupled carborane compounds, analytical problems for undergraduate research (e.g. Zn-65 tracer studies in eel grass), multidisciplinary approaches in lecture and lab.

A.H. Norman and A. Kacmarczyk, Nitrile Addition to Polyhedral Boranes in the Presence of Iron (III) Chloride, J. Inorg. Chem., 13(10), 2316-21 (1974).

SIMMONS COLLEGE

Boston, MA 02115

Fall 1978 ug enrollment 1650

Degrees offered B.S.

Telephone (617) 738-2181

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 9 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 1
3. 1978 seniors & their placement: Total 6 Grad. school 3 Industry 2 Professional schools 1 Other ________.
4. Senior majors, average past five years: 8 .
5. Students involved in research, average past five years: Acad. yr. 5 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 20,000 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR (PE R-20)	LC (Du Pont 841)
MS (Du Pont 21-491)	GC (Varian 1520)
UV (Hitachi EPS-3T)	Computing Integrator (Autolab System IV)
IR (PE 467)	
X-Ray (Powder Diffraction and access to SYNTEX P2_1 automated diffractometer)	

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? No Total journal subscriptions? 26 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 4 .
4. Computer facilities: Department; DECLAB 11/03: Campus; Timesharing to DEC 11/70, HP 2000/ACCESS, IBM 370/168; Tektronix 4010 Graphics Terminal, 4662 Digital Plotter.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   Equipment - $2,000. Other - approx. $3,000.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   Du Pont College Science Grant, $6,500

3. Faculty teaching loads: Contact hours 13 Load credit for research? No
4. Sabbatical or leave support for research: Faculty can apply for sabbatical leave at 50% salary full year, full salary for 1/2 year. Frequency averages every 7th year.

FACULTY PROFILE

BECK, MAE L. (b.1926) Associate Professor. B.S., 1950, Michigan State University, M.A., 1955, Smith College, Ph.D., 1960, University of Pennsylvania. Organic Chemistry. Organic sulfur chemistry, free radical oxidations.

BELL, JERRY A. (b.1936) Professor. A.B., 1958, Harvard University, Ph.D., 1962, Harvard University. Physical Chemistry. Diazirine photolysis, photosensitized methylenecyclopropane reactions.

M.Berger, J.A.Bell, and C.Steel, Spectroscopic Determination of Thermodynamic Quantities, J. Chem. Ed., 52, 191 (1975).

J.A.Bell, Content and Context, J. Chem. Ed., 52, 182(1975).

J.A.Bell, Laboratory Aids: Promethean Gift or Procrustean Bed?, J. Chem. Ed., 52, 35(1975).

J.A.Bell, M.Berger, and C.Steel, The Effect of Temperature and Pressure on the Lifetime of Benzophenone Emission, Chem. Phys. Lett., 28, 205(1974).

J.A.Bell and J.D.MacGillivray, Photosensitized Oxidation by Singlet Oxygen: An Adaptable Photochemical System, J. Chem. Ed., 51, 677(1974).

Grants active 1977-8: NSF-[illegible]ULE, $7,700, Interactive Auto-Tutorial Programs for Complex Instruments.

BOWERS, PETER G. (b.1937) Associate Professor. B.A., 1961, Trinity College, Cambridge University, Ph.D., 1964, University of British Columbia. Physical Chemistry. Kinetics of the decomposition of formic acid in sulfuric acid; phase waves in oscillating reactions.

P.G.Bowers and *G.Rawji, Periodic Evolution of Carbon Monoxide in the Dehydration of Formic Acid by Sulfuric Acid, J. Phys. Chem., 81, 1549(1977).

Grants active 1977-8: Simmons College Fund for Research, $430, Oscillatory Gas-Evolution Reactions.

BRAUNER, PHYLLIS A. (b.1916) Professor. A.B., 1938, Wheaton College, M.A., 1940, Wellesley College, Ph.D., 1959, Boston University. Analytical Chemistry. Chemical speciation by high pressure liquid chromatography; synthesis of rare earth laser materials.

P.A.Brauner, P.L.Brezonic, and W.Stumm, Trace Metal Analysis by Anodic Stripping Voltametry: Effect of Sorption by Natural and Model Organic Compounds, Water Research, 10, 605(1976).

P.A.Brauner and W.Stumm, Chemical Speciation in Chemical Oceanography, Riley and Skirrow, Eds., Academic Press, New York, 1975.

HARTMAN, ICLAL S. (b.1930) Professor. A.B., 1950, Mount Holyoke College, M.A., 1951, Mount Holyoke, Ph.D., 1963, University of Florida. Biochemistry.

F.J.Waller, I.S.Hartman and *S.T.Kwong, Titration of Alanine monitored by NMR Spectroscopy, J. Chem. Ed., 54, 447(1977).

PIPER, JAMES U. (b.1937) Professor and Chairman. B.S., 1959, Massachusetts Institute of Technology, M.S., 1961, Emory University, Ph.D., 1963, Emory University. Organic Chemistry. New amino protecting groups; synthesis of β-lactams related to penicillin.

J.U.Piper, *M.Allard, *M.Faye, *L.Hamel, and V. Chow, Kinetics and Mechanism of Ynamine-Isocyanate Additions, J. Org. Chem., 42, 4261(1977).

SOLTZBERG, LEONARD J. (b.1944) Associate Professor. B.S., 1965, University of Delaware, M.A., 1967, Brandeis University, Ph.D., 1969, Brandeis University. Physical Chemistry. Mechanism of a solid-solid phase transformation; pattern recognition analysis.

Ten publications, 1974-78.

L.J.Soltzberg, *M.W.Athearn, *J.E.Levy, and *E.L.Simpson, Interferometric Study of a Solid-Solid Phase Transition, App. Optics, 16, 3206(1977).

L.J.Soltzberg and C.L.Wilkins, Molecular Transformations: A Potential Tool for Structure-Activity Studies, J. Amer. Chem. Soc., 99, 439(1977).

L.J.Soltzberg, *P.A.Piliero, and *M.R.Shea, Optical Study of the Phase Transition in Phenanthrene Single Crystals, Mol. Cryst. Liq. Cryst., 29, 151(1974).

Grants Active 1977-8: Petroleum Research Fund, $11,000, Charge-Transport/Structure Relationship in an Organic Photoconductor.

THE UNIVERSITY OF THE SOUTH

Sewanee, TN 37375

Fall 1978 ug enrollment 1030

Degrees offered B.S., B.A.

Telephone 615-598-5931

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2. Support staff: FTE's secretary ____ Stockrm 1/3 Technician 1/4
3. 1978 seniors & their placement: Total 5 Grad. school ____ Industry ____ Professional schools 5 Other ____.
4. Senior majors, average past five years: 5 .
5. Students involved in research, average past five years: Acad. yr. 3 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 10,000 % used for teaching 90 Research 10
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

UV-Vis (P-E 552)
IR (P-E 72)
GC (Varian 90-P)
Coulometer (Sargent Welch, IV)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 20 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 6 .
4. Computer facilities: Campus; HP 2000 F, Altair, x-y plotter.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

Approx. $1000/yr, supplies; $8,000/yr equipment.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
3. Faculty teaching loads: Contact hours 12 Load credit for research? occasional
4. Sabbatical or leave support for research: Every 7th year, faculty can apply for half-year at full salary, full year at half salary.

Faculty and students may take spring semester at Oak Ridge National Laboratory for full time research in cooperative ug plan.

FACULTY PROFILE

BORDLEY, JOHN L. Jr. (b. 1943) Associate Professor. B.S., 1965, Davidson College, Ph.D., 1972, The Johns Hopkins University. *Physical Chemistry*. Computer applications.

J. L. Bordley, Jr. and Paul H. Emmett, Carbon-14 Tracer Studies of the Secondary Reactions in the Cracking of Hexadecane over Zeolite Catalysts, *J. of Catalysis*, *42*, 367 (1976).

J. L. Bordley, Jr., NSF, Science Faculty Professional Development Grant $10,234.

CAMP, DAVID B. (b. 1911) Professor Emeritus. B.S., 1941, The College of William and Mary, Ph.D., 1950, University of Rochester. *Organic Chemistry*. Part-time teaching.

GUENTHER, WILLIAM B. (b. 1928) Professor, Chairman. B.A., 1948, Oberlin College, Ph.D., 1954, University of Rochester. *Physical and Analytical Chemistry*. Equilibrium in aqueous solutions.

W. B. Guenther, Buffers, Acids, Bases, and pH., CRC Handbook of Nutrition and Food. Chemical Rubber Co., Cleveland, Ohio, 1977.

W. B. Guenther, CHEMICAL EQUILIBRIUM, a Practical Introduction for the Physical and Life Sciences. 248 pp. Plenum Publishing Crop., New York, 1975.

W. B. Guenther, QUANTITATIVE CHEMISTRY, Measurements and Equilibrium. 400 pp. Japanese translation, Hirokawa, Tokyo, 1973. (Original in English, Addison-Wesley, 1968.)

KIRVEN, EDWARD P. (b. 1946) Assistant Professor. B.A., 1968, The University of the South, Ph.D., 1976, University of Minnesota. *Organic Chemistry*. Biosynthesis and synthetic methods.

E. Leete and E. P. Kirven, Biosynthesis of Tropic Acid: Feeding Experiments with Cinnamoyltropine and Littorine, *Phytochemistry*, *13*, 1501, (1974).

LOWE, JAMES N. (b. 1936) Professor. B.S., 1959, Antioch College, Ph.D., 1964, Stanford University. *Organic, Biochemistry*. Biochemical reaction mechanisms.

J. N. Lowe, L. L. Ingraham, J. Alspach and R. Rasmussen, A Proposed Symmetry Forbidden Oxidation Mechanism for the Bacterial Luciferase Catalyzed Reaction, *Biochem. Biophys. Res. Comm.*, *73*, 465 (1976).

J. N. Lowe, H. C. Sorenson and L. L. Ingraham, Dihydrothiamine-Like Substances as Experimental Artifacts, *Biochem. Biophys. Acta*, *385*, 343 (1975).

James N. Lowe and Lloyd L. Ingraham, AN INTRODUCTION TO BIOCHEMICAL REACTION MECHANISMS. 145 pp. Prentice-Hall Inc., Englewood Cliffs, New Jersey, 1974.

SWARTHMORE COLLEGE
Swarthmore, PA 19081

Fall 1978 ug enrollment 1250
Degrees offered B.A.
Telephone (215) KI4-7900

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 3/4 Stockrm 1 Technician 1½
3. 1978 seniors & their placement: Total 16 Grad. school 6 Industry 5 Professional schools 3 Other 2 .
4. Senior majors, average past five years: 8.4 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 6
6. National student honors, past five years (NSF fellowships, etc.)
   3 NSF Fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 18,000 % used for teaching 85 Research 15
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   Perkin-Elmer Model 337 IR Spectrometer
   Hitachi Model R-20B NMR Spectrometer (60 MHz)
   Perkin-Elmer Model 323 UV-Visible-Near IR Spectrometer
   Perkin-Elmer Model 909 Gas Chromatograph
   Durrum Stopped-Flow Spectrophotometer
   Beckman Model J-21B Ultracentrifuge
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes
   Total journal subscriptions? 51 Computer literature search service? No
   Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 42 .
4. Computer facilities:
   On Campus: IBM 1130; 7 IBM 5100's; DEC PDP 11-40 system
   Off Campus: Tiein to IBM 370-;65 System in Philadelphia

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approximately $3000 per year
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   No departmental grants this year (normally a $6500 grant from duPont)
3. Faculty teaching loads: Contact hours 12 Load credit for research? Yes, some
4. Sabbatical or leave support for research:

   Full salary for one semester every fourth year.

FACULTY PROFILE

FEHNEL, EDWARD A. (b. 1922). Professor. B.S., 1943, M.S. 1944, Ph.D. 1946, Lehigh University. Organic chemistry.

Research Interests: Synthetic organic chemistry, stereochemical aspects of thermal and photochemical cycloaddition reactions of certain high strained ring systems and the application of such reactions to stereoselective synthesis.

HAMMONS, JAMES H. (b. 1934). Professor and Chairman. B.A., 1956, Amherst College, M.A., 1962, Johns Hopkins University, Ph.D., 1962, Johns Hopkins University. Organic chemistry.

Research Interests: Electron spin resonance spectroscopy of organic radicals in solution; nonbenzenoid aromatic and antiaromatic ions and radicals.

J.H. Hammons, C.T. Kresge,* and L.A. Paquette. An Electron Spin Resonance Study of the Radical Anions of Two Dimethylcyclooctatetraenes. J. Am. Soc., 98, 8172 (1976).

HEMPEL, JUDITH C. (b. 1941). Assistant Professor. B.A., 1962, Ph.D., 1967, University of Texas at Austin. Physical chemistry.

Research Interests: Correlations of the structure of chemical systems with their electronic and magnetic properties, study of transition metal complexes by means of polarized absorption, emission, and electron spin resonance spectroscopy, effects of trigonal distortions on spin mixed ground states of iron complexes.

Total publications in past 5 years: 10.
J.C. Hempel, D. Klassen, W.E. Hatfield, and H.H. Dearman An EPR Study of Cr^{+3}:K_2SbF_5. J. Chem. Phys., 58, 1479 (1973).
J.C. Hempel, J. Donini, A.B.P. Lever, and B.R. Hollebone Symmetry Adapted Functions and Normalized Harmonic Hamiltonians for the Point Groups O_h, T_d, D_{4h}, C_{4v}, D_{2h}, and C_{2v}. J. Am. Chem. Soc., 96, 1693 (1974).
J.C. Hempel Trigonal Ligand Field and Zero Field Splitting Diagrams for the d^5 Configuration. J. Chem. Phys., 64, 4307 (1976).
J.C. Hempel, R.A. Palmer, and M.C.-L. Yang The Electronic Structure of Tris(Octamethylpyrophosphoramide)Manganese(II) Ion. Electronic Absorption, Emission, and Excitation Spectra of $Mn(OMPA)_3(ClO_4)_2$. J. Chem. Phys., 64, 4314 (1976).
R.A. Palmer, M.C.-L. Yang, and J.C. Hempel The Electronic Structure of Tris(Ethylenediamine)Manganese(II) Ion. Inorg. Chem., 17, 1200 (1978).

Research Support: Research Corporation Grant, $3500, 1977-78; Wagner Free Institute of Science Grant, $5000, 1978-80 (with D.A. Sweigart).

SWEIGART, DWIGHT A. (b. 1945), Associate Professor. B.A., 1967, Franklin and Marshall College; Ph.D., 1971, Northwestern University. Inorganic chemistry.

Research Interests: Reactions of coordinated π-hydrocarbons, reactions of metal porphyrin systems, mechanisms of ligand substitution reactions at five-coordinate transition metal centers, U.V. photoelectron spectroscopy, undergraduate labortory experiments.

Total publications in past 5 years: 21.
A. Crane,* D. Birney,* and D.A. Sweigart Mechanism of Nucleophilic Addition to Coordinated Cycloheptatriene. J. Organometal. Chem., 152, 187 (1978).
D.A. Sweigart and C.N. Wilker* Nucleophilic Addition to Coordinated Cyclobutadiene. J.C.S. Chem. Commun., 304 (1977).
D. Burdige* and D.A. Sweigart Mechanism of Addition of Bases to Five-Coordinate Ferric Porphyrins. Inorg. Chim. Acta, 28, L131 (1978).
D.A. Sweigart and C. Bern* Kinetics of Ligand Substitution on Ferric Horse Heart Myoglobin. Inorg. Chem., 13, 3033 (1974).
D.A. Sweigart, D.E. Cooper,* and J.M. Millican* Ligand Substitution at Five Coordinate Centers. Reactions of Neutral Iron and Cobalt Dithiolene Complexes, Inorg. Chem., 13, 1272 (1974).

Research Support: Research Corporation Grant, $8000, 1975-77; Petroleum Research Funds, $1000, 1977-79; Camille and Henry Dreyfus Teacher-Scholar Grant, $35,000, 1977-82; Wagner Free Institute of Science Grant, $5000, 1978-80 (with J.C. Hempel).

THOMPSON, PETER T. (b. 1929) A.B., 1951, Johns Hopkins University; Ph.D., 1956, University of Pittsburgh. Physical chemistry.

Research Interests: Thermodynamic properties of both aqueous and non-aqueous solutions, especially interactions between solute molecules in such systems; heats of mixing of electrolytes; viscosity studies in solutions of high dielectric constant solvents; solution calorimetry.

Total publications in past 5 years: 6
P.T. Thompson, D.E. Smith and R.H. Wood Enthalpy of Dilution of Aqueous Na_2SO_4 and Li_2SO_4. J. Chem. Engin. Data, 19, 386 (1974).
R.H. Wood, D.E. Smith, H.K.W. Chen and P.T. Thompson Heats of Mixing Aqueous Electrolytes. XII. The Reciprocal Salt Pair Na^+, Li^+/Cl^-, SO_4^{-2}. J. Phys. Chem., 79, 1532 (1975).
P.T. Thompson, R.E. Taylor and R.H. Wood Enthalpy of Fusion and Cryscopic Constant for Ethylene Carbonate. J. Chem. Thermodynamics, 7, 547 (1975).
R.H. Wood, P.T. Thompson, and T.H. Lilley Rapidly Converging Activity Expansions for Representing the Thermodynamic Properties of Fluid Systems: Gases, Nonelectrolyte Solutions, Weak and Strong Electrolyte Solutions. J. Chem. Soc., Faraday Trans. (I), 74, 1301 (1978).
B.Y. Okamoto, R.H. Wood, and P.T. Thompson Freezing Points of Aqueous Alcohols. Free Energy of Interaction of the CHOH, CH_2, CONH, and C=C Functional Groups with Each Other in Dilute Aqueous Solutions. J. Chem. Soc., Faraday Trans. (I), 74, 1990 (1978).

VOET, JUDITH G. (b. 1941). Assistant Professor. B.S., 1963, Antioch College; Ph.D., 1969, Brandeis University. Biochemistry.

Reserach Interests: Mechanisms of enzyme action as deduced from chemical modification studies. Specific research involves the study of the role of cysteine at the allosteric site of yeast pyruvate kinase.

D.J.T. Porter, J.G. Voet and H.J. Bright Direct Evidence for Carbanions and Covalent Carbanion-Flavin Adducts as Catalytic Intermediates in the Oxidation of Nitroethane by D-Amino Acid Oxidase. J. Biol. Chem., 248, 4400 (1973).
J.G. Voet, D.M. Hindenland, R.J.J. Blanck, R.J. Ulevitch, R.G. Kallen and H.C. Dunathan The STereochemistry of Pyridoxal Phosphate Enzymes: Symmetry of Cofactor C_4' Protonation in the Transamination of Holo Serine Hydroxymethylase by D-Alanine. J. Biol. Chem., 248, 841 (1973).
H.C. Dunathan and J.G. Voet Stereochemical Evidence for the Evoluation of Pyridoxal Phosphate Enzymes of Various Function From a Common Ancestor. Proc. Hat. Acad. Sci., 71, 3888 (1974).
D.J.T. Porter, J.G. Voet and H.J. Bright. Mechanistic Features of the D-Amino Acid Oxidase Reactions Studied by Double Stopped-Flow Spectrophotometry. J. Biol. Chem., 252, 4464 (1977).

TRINITY COLLEGE

Hartford, CT 06106

Fall 1978 ug enrollment 1650

Degrees offered B.S., B.A.

Telephone 203/527-3151

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 1 Stockrm 0 Technician 1
3. 1978 seniors & their placement: Total 11 Grad. school 1 Industry 5 Professional schools 2 Other 3 .
4. Senior majors, average past five years: 15 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 19,300 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)
    - MS (Dupont 21-491)
    - NMR (Varian T-60)
    - IR (Beckman IR-12)
    - UV-Vis (Beckman DK-2A)
    - GC (Perkin-Elmer 881)
    - HPLC (LDC)
    - AA (G.C.A./McPherson)
    - AES (Jarrell-Ash)
    - Light Scattering Photometer (Virtis)
    - Polarographic Analyzer (PAR-174)
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 46 Computer literature search service? No Separate chemistry or science library? Yes Librarian? Yes Standing orders for review series and annual reviews (past five years) 20 .
4. Computer facilities: Department; minicomputer, DEC-LSI/11. Campus; PDP/11, multi-user, Basic and Fortran, Dartmouth and Yale time-sharing

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approx. 7000/year for chemicals and equipment. All expenses involved in the presentation of a paper at a meeting.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: du Pont College Science Grant $6,500
3. Faculty teaching loads: Contact hours 12 Load credit for research? none
4. Sabbatical or leave support for research: Sabbatical leave granted every seventh year at 50% salary full year, full salary for 1/2 year.

BOBKO, EDWARD (b. 1925) Professor and Chairman, B.S., 1949, Western Reserve University, Ph.D., 1952, Northwestern University. Organic Chemistry. Correlation of chemical reactivity and spectroscopic parameters.

DEPHILLIPS, HENRY A., JR. (b. 1937) Professor, B.S., 1959, Fordham University, Ph.D., 1965, Northwestern University. Physical Biochemistry. Structure-function relationships in biological macromolecules; activity-composition correlations on metal surfaces.

HEEREN, JAMES K. (b. 1929), Associate Professor, B.S. in Chemistry, 1951, Tufts, M.S., 1952, Tufts, Ph.D., 1960, MIT. Research Associate and Fellow, School of Advance Study MIT (1961-1962). Visiting Professor, Heidelberg, Germany (1969). Organic Chemistry. Organophosphorus compounds and organometallic compounds as they relate to organic synthesis.

HENDERSON, DAVID E. (b. 1946) Assistant Professor, B.A., 1968, St. Andrews Presbyterian College, Ph.D., 1975, University of Massachusetts at Amherst, Analytical Chemistry. Liquid and gas chromatographic analysis of metals, applications of computers to chemical analysis, and thermal analysis.

P.C. Uden and D.E. Henderson, Metal Analysis by Gas Chromatography - A Review, The Analyst, 102, p. 889 (1977).
P.C. Uden, D.E. Henderson, F.P. DiSanzo, R.J. Lloyd, and T. Tetu, Applications of Dexsil and other PLOT G.C. Columns to Metal Compound Separations and Pyrolysis, High Resolution Gas Chromatography, S.P. Cram, Ed., Academic Press 1978.
A. Khalique, W.I. Stephens, D.E. Henderson, and P.C. Uden, The Gas Chromatography of Higher Substituted Tetradentate β-Ketoamine Complexes, Anal. Chim. Acta, 101, 1978.
P.C. Uden, D.E. Henderson, R.J. Lloyd, "Comprehensive Interfaced Pyrolysis Gas Chromatographic Peak Identification System," J. Chromatog., 126, p. 225 (1976).
Cottrell College Science Grant "Piezoelectric Crystal Thermogravimetric Analyzer," $10,500. 1978-80.

MOYER, RALPH O., JR. (b. 1936) Associate Professor, B.S., 1957, Southeastern Massachusetts University, M.S., 1963, University of Toledo, Ph.D., 1969, University of Connecticut. Inorganic Chemistry. Transition Metal Hydrides: synthesis, structure determination, magnetic and electrical property measurements. Six publications, 1975-1978.

R.O. Moyer, R. Lindsay, *D. Marks, "Results of Reactions Designed to Produce Ternary Hydrides of Some Rarer Platinum Metals with Europium or Ytterbium, "Advances in Chemistry Series, No. 167, American Chemical Society, Washington, D.C., 1978, pp. 366-381.
R. Lindsay, R.O. Moyer, *J.S. Thompson, *D. Kuhn, "Preparation, Structure and Properties of Yb_2RuH_6," Inorg. Chem., 15, 3050 (1976).
*W. Kwoka, R.O. Moyer, R. Lindsay, "Alkylenebisdithiocarbamates of Oxovanadium(IV), Chromium(III), and Manganese(II), J. Inorg. Nucl. Chem., 37, 1889 (1975).

MOYER, RALPH O., JR. cont'd

*J.S. Thompson, R.O. Moyer, R. Lindsay, "Preparation, Structure, and Properties of Eu_2RuH_6," Inorg. Chem., 14, 1866 (1975).

R.O. Moyer, "Synthesis and Structure of MgO or CaO - An Integrated Inorganic-Physical Experiment," J. Chem. Ed., 52, 612 (1975).

SMELLIE, ROBERT H. JR., (b. 1920) Professor, B.S., 1942, M.S., 1944, Trinity College, Ph.D., 1951, Columbia University. Physical Chemistry. Transition metal combustion catalysts, properties of metal oxide suspensions in non-aqueous media, radio frequency spectrometry.

TRINITY UNIVERSITY

San Antonio, TX 78284

Fall 1978 ug enrollment 2,769

Degrees offered B.S., B.A.

Telephone 512-736-7523

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2.Support staff: FTE's secretary 3/4 Stockrm 1/2 Technician 1/2
3. 1978 seniors & their placement: Total 6 Grad. school 3 Industry - Professional schools 3 Other - .
4. Senior majors, average past five years: 6 .
5. Students involved in research, average past five years: Acad. yr. 8 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 25,000 ; % used for teaching 70 Research 30
2. Instrumentation: List up to 10 major instr. available for ug research (NMR,IR, etc.)

NMR-60MHz (Varian T-60)
MS (Varian EM600)
UV-VIS(Cary 118C, Beckman DB-G and DU-2, Perkin-Elmer Hitachi)
Parr Medium Pressure Hydrogenator
IR (P-E 287, 337)
GC (Varian 1200, 2400, 920)
HPLC (Waters, High Pressure Pump)
X-ray (Norelco, Picker, Supper-Weissenberg)

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 45 Computer literature search service? yes Separate chemistry or science library? no Librarian? no Standing orders for review series and annual reviews (past five years) 20 .

4. Computer facilities: University IBM 370/155. Department: Datapoint minicomputer with plotter, A-D converter.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Approximately $5,500/yr. for faculty through University grants. $12000/yr. for chemicals and glassware; $3,000/yr. for equipment.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: Dreyfus, $6,500/yr.; ISEP, $11,000 (last year);

3. Faculty teaching loads: Contact hours 11 Load credit for research? no

4. Sabbatical or leave support for research: Faculty can apply for academic leave at 50% salary full year, full salary 1/2 year. Frequency averages not applicable since program is only two years old.

FACULTY PROFILE

BURKE, JOHN A. (b. 1936) Professor and Dean of the Faculty of Sciences, Mathematics and Engineering. B.S., 1959, Texas Tech College, M.S., 1961, Ohio State University, Ph.D., 1963, Ohio State University. Inorganic Chemistry. Coordination Chemistry.

J. C. Shoup and J. A. Burke, Jr., The Kinetics and Mechanism of the Reactions of Substituted 8-Mercaptoquinoline Complexes of Nickel(II) with Some Alkyl Halides, Inorganic Chemistry, 12, 1851(1973).

S. E. Campbell and J.A. Burke, Jr., The Base Hydrolysis of Cis-Dichlorobis(1,10-Phenanthroline)Cobalt(III) Chloride, Texas Journal of Science Vol. XXVI, pp. 553-558.

CHRISTENSEN, C. G. (b. 1946) Assistant Professor. B.A., 1968, Augustana College, S.D., Ph.D., 1973, Rice University. Organic Chemistry. Organic synthesis and natural products.

R. V. Stevens, C. G. Christensen, R. M. Cory, and E. Thorsett, The Total Synthesis of Nickel (II) Octamethylcorphin, J. Amer. Chem. Soc., 97, 5940(1975).

CLYDE, DALE D. (b. 1938) Assistant Professor. B.S., 1960, Hastings College, Ph.D., 1966, Iowa State University. Analytical Chemistry. Analysis of inorganic and physical systems, mass spectroscopy.

D.D. Clyde and *M. A. Warner, Spectrophotometric Determination of Cyanide by Use of Aqueous Potassium Iodide and Mercury (II) Iodide, Analyst, 103, 648(1978).

KURTIN, WILLIAM E. (b. 1943) Associate Professor. B.A., 1965, St. Thomas University, Ph.D., 1969, Texas Tech University. Biochemistry. Photochemistry and spectroscopy of biomolecules; photodynamic action; phototherapy of neonatal jaundice.

J. A. Zuclich and W. E. Kurtin, Oxygen Dependence of Near-Ultraviolet Induced Corneal Damage, Photochem. Photobiol., 25, 133(1977).

W. E. Kurtin and J. A. Zuclich, Action Spectrum for Oxygen-Dependent Near-Ultraviolet Induced Corneal Damage, Photochem. Photobiol., 27, 329 (1978).

W. E. Kurtin, Spectroscopy and Photochemistry of Bilirubin Photoproducts I. Methylvinylmaleimide, Photochem. Photobiol., 27, 503(1978).

Grants Active 1977-1978: Robert A. Welch Foundation Grant, $15,000.

PLUMMER, BENJAMIN F. (b. 1936) Professor, Chairman. B. S., 1958, Iowa State University, Ph. D., 1962, The Ohio State University. Physical-Organic Chemistry. Synthetic and Mechanistic Organic Photochemistry. Spectroscopy.

Eight publications, 1973-1978.

B. F. Plummer, W. I. Ferree, Jr., and W.W. Schloman, Jr., Photochemical Heavy Atom Effect. V. The Reaction of Acenaphthylene with cis and trans-1,3-Pentadiene. J. Amer. Chem. Soc., 96, 7741 (1974).

B. F. Plummer and W. W. Schloman, Jr., The External Heavy Atom Effect on the Photodimerization of Thianaphthene-1,1-Dioxide, J. Chem. Soc., Chem. Commun., 705(1974).

B. F. Plummer, A. Simple Filter Holder for a Commercial Immersion Well Photolysis Apparatus, Mol. Photochem., 6, 245 (1974).

B. F. Plummer and W. W.Schloman, Jr., Steric and Spin-Orbital Effects on the Photodimerization of Thianaphthene 1,1-dioxide, J. Am. Chem. Soc., 98, 3254(1976).

PLUMMER, BENJAMIN F., cont'd

B. F. Plummer, D. M. Chihal, *D. D'Orsogna, and *B.M. Blenkarn, Synthesis and Reactions of 7, 10-Methano-7,8,9,10,11,11-hexachloro-7, 10-dihydrofluoranthene, J. Org. Chem., 42, 4092(1977).

Grants Active 1977-1978: Robert A. Welch Foundation Grant: $17,000.

SCHILLING, JESSE W. (b. 1939)Associate Professor. B. S., 1960, Juniata College, M. S., 1963, Yale University, Ph.D., 1968, University of Michigan, Physical Chemistry. Crystal structures, crystallization of proteins, laboratory computing, computer graphics, chemical data management.

H. W. Wyckoff and F. M. Richards, Atlas of Molecular Structures in Biology: Vol. 1. Ribonuclease, figures by J. W. Schilling and J. L. Mouning, Oxford University Press, 1974.

Grants Active 1978-79: Trinity University Grant, $700. Studies in the Crystallization of Enzymes.

UNION COLLEGE

Schenectady, NY 12308

Fall 1978 ug enrollment 2000

Degrees offered B.S., M.S.

Telephone 518-370-6249

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 10 . 2.Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 19 Grad. school 8 Industry 6 Professional schools 4 Other 1 .
4. Senior majors, average past five years: 18 .
5. Students involved in research, average past five years: Acad. yr. 15 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 15,500 Lab % used for teaching 70 Research 30 with overlap
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR - 60 MHz (P-E R24A)
UV-VIS-(Carey 118, Cary 14, PE 202)
Fluorescence - (PE MPF-2A)
GC - (P & E 900, +3 others)
IR - (P & E 237, 727)
DSC (PE DSC-1B)
GPC (WA-GPC/ALC 301)
Stopped Flow (Aminco-Morrow)
Counting Systems (Baird Atomic models 7150, 7250, 7650)
GC/MS - (Hewlett Packard 5992A)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 46 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 19 .
4. Computer facilities: Department - Altair 8800; College - Burroughs 6805.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Departmental support up to ~$500/yr/person for chemicals; 7-10,000/yr for equipment; college grants of $1000/person/yr available.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: DuPont $6500.
3. Faculty teaching loads: Contact hours 9* Load credit for research? No
   * trimester
4. Sabbatical or leave support for research: Full pay 1/2 year, half pay full year, averaging every 7th year. Mellon grant money available internally for leave or course reductions.

ANDERSON, JANET S. (b. 1950) Assistant Professor. B.S., 1972, College of William & Mary, Ph.D., 1976, University of Wisconsin-Madison. *Physical Chemistry*. Monte Carlo simulation of protein folding; conformational analysis of small peptide molecules.

Seven publications, 1973-1978.

D.E. Kranouchl, P.H. Verdier, and J.M. Spencer, Relaxation of Fluctuations in the Shape of Random Coil Polymer Chain, *J. Chem. Phys.*, *59*, 3861 (1973).

J.S. Anderson and W.E. Vaughan, Dielectric Relaxation of Rod-like Poly (n-hexyl isocyanate) in Nonpolar Solvents, *Macromolecules*, *8*, 454 (1975).

J.S. Anderson and W.E. Vaughan, Comparisons of Model Calculations of the Dipolar Autocorrelation Function, *J. Chem. Phys.*, *64*, 4034 (1976).

J.S. Anderson, W.E. Vaughan, L.C. Rosenthal, and H.L. Strauss, Comment on Rotational Correlation in Chloroform, *J. Chem. Phys.*, *65*, 2481 (1976).

J.S. Anderson, H.A. Scheraga, Conformational Energy Calculations on the Contraceptive Tetrapeptide, H-Thr-Pro-Arg-Lys-OH, *Macromolecules*, in press.

HAYES, DAVID M. (b. 1943) Assistant Professor. B.S., 1966, Massachusetts Institute of Technology, Ph.D., 1971, Cornell University. *Physical Chemistry*. Quantum mechanical calculations of the electronic structure of molecules. Theoretical determination of the mechanisms and energetics of chemical reactions, especially reactions of biochemical significance.

Seven publications, 1973-1978.

R.L. Jaffe, D.M. Hayes and K. Morokuma, Photodissociation of Formaldehyde: Potential Energy Surfaces for $H_2CO^* \longrightarrow H_2 + CO$, J. Chem. Phys., 60, 5108 (1974).

D.M. Hayes, G.L. Kenyon and P.A. Kollman, Theoretical Calculations of the Hydrolysis Energies of Some High Energy Molecules. I. The Phosphoric and Carboxylic Acid Anhydrides, *J. Amer. Chem. Soc.*, *97*, 4762 (1975).

D.M. Hayes and P.A. Kollman, Electrostatic Potentials of Proteins. I. Carboxypeptidase A, *J. Amer. Chem. Soc.*, *98*, 3335 (1976).

D.M. Hayes and P.A. Kollman, Resolution of the Rotational Potential in H_3PO_4, $H_2PO_4^-$, and HPO_4^{--}, *J. Amer. Chem. Soc.*, *99*, 2150 (1977).

D.M. Hayes, G.L. Kenyon and P.A. Kollman, Theoretical Calculations of the Hydrolysis Energies of Some High Energy Molecules. II. A Survey of Some Biologically Important Hydrolytic Reactions, *J. Amer. Chem. Soc.*, *100*, 4331 (1978).

Grants active 1977-1978: Research Corporation, $8000, Environmental Effects in Enzyme Catalysis.

HULL, LESLIE A. (b. 1943) Associate Professor & Chairman. B.S., 1965, University of Rochester, Ph.D., 1971, Harvard University. *Organic Chemistry*. Physical organic chemistry, oxygen and ozone chemistry, radical reactions.

Seven publications, 1973-1978.

P.D. Bartlett and L.A. Hull, Cycloaddition XVIII. Isomer Distributions in the Photosensitized Addition of 1-Chloropropene to Cyclopentadiene, *J. Org. Chem.*, *40*, 831 (1975).

*D.J. Miller, *T.E. Nemo and L.A. Hull, Rate Study on the Ozonolysis of Acetylenes, *J. Org. Chem.*, *40*, 2675 (1975).

*S. Jackson and L.A. Hull, Reductive trapping in the Ozonolysis of Diphenylacetylene, *J. Org. Chem.*, *41*, 3340 (1976).

*S. Carr, *A. Fritzson, L.A. Hull, T.C. Werner and G. Williams, chapter entitled Interfacing of a Nuclear Magnetic Resonance Spectrometer to a Low Cost Microcomputer-Based Data Acquisition System, in the book *Microcomputer Design and Applications*, Academic Press (1977).

L.A. Hull, MINDO/3 Calculations on the Stability of Criegee Carbonyl Oxides, *J. Org. Chem.*, *43*, 2780 (1978).

Grants active 1977-1978: Petroleum Research Fund, Type B, $9500, Alkyne-Ozone Reactions.

MARTIN, WILLIAM B., Jr. (b. 1923) Professor, B.A., 1948, M.A., 1949, Clark University, Ph.D., 1953, Yale University. Organic Chemistry. Syntheses terpenoid resin acids, biochemistry (paramecium aurelia), syntheses of [2.2] paracyclophane systems, electron-spin-resonance studies, hydrothermal growth of single quartz crystals, syntheses and kinetic studies of sterically hindered esters.

Five publications 1973-1978, plus translation of 3 volumes of The HMO-model and its Applications, Heilbronner & Bock (Verlag Chemie and John Wiley, 1976).

F. Gerson, W.B. Martin, Jr., F. Sondheimer and H. Wong, Radical Ions of Benzo (b)-Biphenylene, Helv. Chim. Acta., 58, 243-7 (1975).

F. Gerson, W.B. Martin, Jr., and C. Wydler, Structures of Ion Pairs of [2.2]-Paracyclophane Radical Anion and K^+, Helv. Chim. Acta., 59, 1365-70 (1976).

F. Gerson, W.B. Martin, Jr., G. Plattner, F. Sondheimer, and H. Wong, E.S.R. Spectra and Structure of Dibenzo (a,e)-Cyclooctene Series, Helv. Chim. Acta, 59, 2038-48 (1976).

F. Gerson, W.B. Martin, Jr., and C. Wydler, π-Spins in Radical Ions of [2.2]-Paracyclophanes and Some Symmetric Benzo-Derivatives, J. Am. Chem. Soc., 98, 1318-20 (1976).

J. Brohin, F. Gerson, W.B. Martin, Jr., and C. Wydler, π-Spin in Radical Anions of Benzo-[2.2]-Paracyclophanes and Those of [2.2]-(1,4)-Naphthalenophanes, Helv. Chim. Acta, 60, 1915-23 (1977).

SCAIFE, Charles W.J. (b. 1938) Associate Professor. B.A., 1959, Ph.D., 1966, Cornell University. Inorganic Chemistry. Borazine chemistry, hydration of oxyanions.

S.J. Baum and C.W.J. Scaife, Chemistry: A Life Science Approach, Macmillan Publishing Co., Inc., New York (1975).

S.J. Baum and C.W.J. Scaife, Answer Book for Chemistry: A Life Science Approach, Macmillan Publishing Co., Inc., New York (1975).

SCHAEFER, ROBERT W. (b. 1927) Associate Professor. B.S., 1949, Siena College, M.S., 1951, Union College. Analytical Chemistry. Ion specific electrodes.

SHEFFER, HOWARD E. (b. 1918) Professor. B.S., 1939, Union College, M.S., 1940, Rensselaer Polytechnic Institute, Ph.D., 1943, Cornell University. Organic and Polymer Chemistry. Synthesis of heterocyclic compounds. Cationic Polymerization. Consultant - high temperature electrical insulation.

*D. Alsofrom, *H. Grossberg, H. Sheffer, A New Synthesis of S-triazines, J. Heterocyclic Chem., 13, 917 (1976).

*C. Snyder, *W. McIver, and H. Sheffer, Cationic Polymerization of β-pinene and Styrene, J. of Applied Poly. Sci., 21, 131 (1977).

H. Sheffer and *M. Luhta, The Cationic Polymerization of Terpenes and Styrene, Finn. Chem. Lett., 28, (1977)

H. Sheffer, *A. Sivola and *J. Savelainen, The Preparation and Characterization of Styrene-β-pinene Polymers, Finn. Chem. Lett., 122 (1978)

SOWA, JOHN R. (b. 1934) Associate Professor. B.S., 1956, University of Notre Dame, Ph.D., 1964, University of Pennsylvania. Organic Chemistry. Synthesis and Mechanisms involving organo-phosphorous, silane, sulfur chemistry, micellar reactions, polymer chemistry, diazonium salts, elimination reactions and NMR spectroscopy.

J.R. Sowa and *E.C. Calamai, An Improved Method for the Preparation of Diphenylacetylene, OPPI, 6, 183-4 (1974).

J.R. Sowa, *E.J. Lamby, *E.C. Calamai, *D.A. Benko and *A. Gordinier, Preparation of Alkynes, OPPI, 7, 137-144 (1975).

H.C. Cole and J.R. Sowa, Low Melting Nematic 4,4'-Bis (Alkylbenzal)-2-Chloro-1,4-Phenylene diamines, Mol. Cr. Liq. Cr., 30, 149-154 (1975).

SOWA, JOHN R., (cont'd)

J. Epstein, J.R. Sowa et. al., Micellar Acceleration of Organophosphates Hydrolysis by Hydroximinomethylpyridinium Type Surfactants, J. Org. Chem., 43, 2816 (1978).

Several Reviews for Choice

WEICK, CHARLES F. (b. 1931) Associate Professor. B.S., 1953, Mt. Union College, Ph.D., 1959, University of Rochester, Inorganic and Radiochemistry. Synthesis, kinetics, optical activity of metal complexes.

D.L. Fant and C.F. Weick, Substitution Reactions of Sterically Hindered Gold (III) Complexes, Inorganic Chemistry, 12, 1864 (1973).

R.D. Gillard, S.H. Laurie, D.C. Price, D.A. Phipps, and C.F. Weick, Optically Active Co-ordination Compounds. Part XXXV. Configurations, Preparations and Reactivities of Some Complexes of Amino-acids, J. Chem. Soc., Dalton Transactions, 1385 (1974).

R.D. Gillard, P.R. Mitchell, and C.F. Weick, Optically Active Co-ordination Compounds. Part XXXVI. Convenient Resolution of the (Ethylenediaminetetraacetato)cobaltate (III) Ion, J. Chem. Soc., Dalton Transactions, 1635 (1974).

WERNER, THOMAS C. (b. 1942) Associate Professor. B.S., 1964, Juniata College, Ph.D., 1969, M.I.T. Analytical Chemistry. Fluorescence Properties of Organic Compounds.

Seven publications, 1973-1978.

T.C. Werner, *R. Fisch and *G. Goodman, Spectral Studies on Aromatic Esters of 9-Anthroic Acid, Spectrosc. Lett., 1, 385 (1974).

T.C. Werner, Use of Fluorescence to Study Structural Changes and Solvation Phenomena in Electronically Excited States, in Modern Fluorescence Spectroscopy, Vol. 2, E. Wehry, ed., Plenum Press (1976).

T.C. Werner, *T. Matthews and *B. Sollar, An Investigation of the Fluorescence Properties of Carboxyl Substituted Anthracenes, J. Phys. Chem., 80, 533 (1976).

*S. Carr, *A. Fritzson, L. Hull, T.C. Werner, G. Williams, Interfacing of a Nuclear Magnetic Resonance Spectrometer to a Low Cost Microcomputer-Based Data Acquisition System, in Microcomputer Design and Applications, S. Lee, ed., Academic Press (1977).

T.C. Werner, *W. Hawkins, *J. Facci, *R. Torrisi, *T. Trembath, Substituent Effects on the Fluorescence Properties of Aromatic Esters of 9-Anthroic Acid, J. Phys. Chem., 82, 298 (1978).

Grants active 1977-1978: Petroleum Research Fund, Type B, $9500, Fluorescence of Anthroate Esters.

WIER, LARRY M. (b. 1950) Assistant Professor. B.A., 1972, SUNY-Binghamton, Ph.D., 1977, University of North Carolina at Chapel Hill. Analytical Chemistry. Chemically modified electrodes applied to biological molecules.

P.R. Moses, L. Wier and R.W. Murray, Chemically Modified Tin Oxide Electrode, Anal. Chem., 47, 1882 (1975).

D.F. Untereker, J.C. Lennox, L.M. Wier, P.R. Moses, and R.W. Murray, Chemically Modified Electrodes IV. Evidence for Formation of Monolayers of Bonded Organosilane Reagents, J. Electroanal. Chem., 81, 309 (1977).

P.R. Moses, L.M. Wier, J.C. Lennox, H.O. Finklea, J.R. Lenhard and R.W. Murray, Chemically Modified Electrodes IX. ESCA Studies of Alkylaminesilanes Bound to Metal Oxide Electrodes, Anal. Chem., 50, 576 (1978).

L.M. Wier and R.W. Murray, Chemically Modified Electrodes VIII. The interaction of Aqueous RuCl$_3$ with Native and Silanized SnO$_2$ Electrodes, in press.

VASSAR COLLEGE

Poughkeepsie, N. Y. 12601

Fall 1978 ug enrollment 2250

Degrees offered B.A., M.S.

Telephone (914) 452-7000

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8.5. 2. Support staff: FTE's secretary 3/8 Stockrm 2 Technician 3/4
3. 1978 seniors & their placement: Total 13 Grad. school 6 Industry 0 Professional schools 3 Other 4.
4. Senior majors, average past five years: 14.
5. Students involved in research, average past five years: Acad. yr. 10 Summer 5
6. National student honors, past five years (NSF fellowships, etc.)

   none

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 33,650 % used for teaching 75% Research 25%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   NMR (Varian T60)
   MS (Varian EM600)
   UV-VIS (Cary 14; Beckman DB, DU, DU2; Guilford 240)
   GC (F & M 240; Hewlitt-Packard; P & E 3420, Varian 920)
   AA (Jarrell-Ash)
   IR (Perkin Elmer 167,521)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 67 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 6.

4. Computer facilities: Department: none; Campus: IBM 370/125, 3 IBM 5100.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Approx. $2,500/yr. chemicals and glassware.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: none

3. Faculty teaching loads: Contact hours 10 Load credit for research? No

4. Sabbatical or leave support for research: Tenured faculty may apply for one semester each seven semesters or one year each seven years at full pay; sabbatical leave at full pay for assistant professors during second 3-year contract.

BECK, CURT W. (b.1927) Professor. B.S., 1951, Tufts University, Ph.D., 1955, Massachusetts Institute of Technology. Organic Archaeological Chemistry. Provenience analysis of archaeological amber artifacts; analysis of resins, pitches, tars, waxes and oils in archaeological contexts.

Eleven publications, 1973-1978.

Curt W. Beck and Theresa Liu,* "The Origin of Archaeological Amber Artifacts from Yugoslavia," Academie Serbe des Sciences et des Arts, Belgrade, Bulletin, 51 (1974) pp. 115-118.

Curt W. Beck, Constance A. Fellows,* and Edith MacKennan,* "Nuclear Magnetic Resonance Spectrometry in Archaeology," in Curt W. Beck, editor, Archaeological Chemistry, (Advances in Chemistry, No.138), American Chemical Society, 1975, pp. 226-235.

Curt W. Beck, Theresa Liu* and Richard Nunan,* "Die Herkunft der Bernsteinfunde vom Hagenauer Forst." Beiträge zur Archäologie und Kunstgeschichte, Bericht der Staatlichen Denkmalpflege im Saarland, 22 (1975) 5-17.

Joan M. Todd, Marijean H. Eichel, Curt W. Beck and Angela Macchiarulo,* "Bronze and Iron Age Amber Artifacts in Croatia and Bosnia-Hercegovina," Journal of Field Archaeology, 3 (1976) 313-327.

Curt W. Beck and Theresa Liu,* "Origine de l'ambre des grottes du Hasard et du Prevel," Gallia Prehistoire, 19 (1976) 201-207.

Grants active 1977-1978: Research Corporation Cottrell College Science Grant, $15,000; German Academic Exchange Service, $1,200.

CLARK, PATRICIA A. (b.1940) Associate Professor and Chairman. B.A., 1962, University of North Carolina, Greensboro; Ph.D., 1967, 5-College Program, University of Massachusetts. Physical Chemistry. Absorption spectra of organic charge-transfer complexes and of platinum-olefin complexes; molecular orbital theory.

F. Brogli, P.A. Clark, E. Heilbronner and M. Neuenschwander, "Pi Ionization Potentials of Alkylfulvenes, or the Limitations of Koopmans' Theorem," Ang.Chemie Internl. Edn., 12, 422 (1973).

P. A. Clark, R. Gleiter, and E. Heilbronner, "Photoelectron Spectra of Planar Sulfur Heterocycles," Tetrahedron 29, 3085 (1973).

P. A. Clark and L. W. Pickett, "Vacuum Ultraviolet Spectra of Ethyleneimine and Trimethyleneimine," J. Chem. Phys., 64, 2062 (1976).

P. A. Clark, T. J. Lerner,* S. Hayes,* and S. Fischer,* "Spectroscopic Studies of Charge-Transfer Complexes of Diazabenzenes with Iodine," J. Phys. Chem., 80, 1809 (1976).

Grants active 1978: Research Corporation Cottrell College Science Grant, $8,500.

GOUNARIS, ANNE D. (b.1924) Professor. A.B., 1955, Boston University, Ph.D., 1960, Harvard University. Biochemistry. Protein structure; enzyme mechanisms; proteolytic processing of proteins.

A. D. Gounaris, I. Turkenkopf, L. L. Civerchia,* and J. Greenlie,* "Pyruvate Decarboxylase III. Specificity Restrictions for Thiamine Pyrophosphate in the Protein Association Step, Sub-unit Structure," Biochim.et Biophys.Acta 405, 492-499 (1975).

HILLIS, MARY O. (b.1919) Professor. A.B., 1941, MacMurray College, M.S., 1942, University of Illinois, Ph.D., 1944, University of Illinois. Analytical Chemistry.

HOPPER, STEVEN P. (b.1945) Assistant Professor. B.A., 1967, Wabash College, Ph.D., 1972, Massachusetts Institute of Technology. *Organometallic Chemistry*. Silaethylene chemistry; heterogeneous chemistry.

Nine publications, 1974-1978.

S. P. Hopper and M. J. Tremelling, "High Temperature Heterogeneous Reactions. II. Reactions at Silicon Centers," *Syn. React. Metal-Org. Chem.*, *7*:157 (1977)

S. P. Hopper, M. J. Tremelling, R. J. Ginsberg* and P. C. Mendelowitz,* "Heterogeneous Reactions.III. Evidence for an Alkoxide Induced 1,2-Hydride Shift from Silicon to Carbon under Heterogeneous Gas/Solid Phase Reaction." *J. Organometal. Chem.*, *134*, 173 (1977).

M. J. Tremelling, S. P. Hopper and J. Quirk,* "Heterogeneous Reactions. IV. The High Temperature Reduction of 3-Bromotricyclo [2.2.1.0^{2,6}] Heptane with Sodium Methoxide." *Tetrahedron Lett.*, 3119 (1977).

M. J. Tremelling, S. P. Hopper and P. C. Mendelowitz,* "Heterogeneous Reactions. V. The Anti Orientation of Elimination for the Dehydrobromination of *meso* and *dl* 2,3-Dibromobutane and E and Z 2-Bromobut-2-ene with Solid Potassium *tertiary*-Butoxide." *Journal of Organic Chemistry*, *43*, 3076 (1978).

S. P. Hopper, M. J. Tremelling and E. W. Goldman,* "Heterogeneous Reactions. VI. Reactions of Trimethylchlorosilane, Dimethyldichlorosilane and Chloromethyldimethylchlorosilane with Potassium *tertiary*-Butoxide and Sodium Methoxide." *J. Organomet. Chem.*, 156, 331 (1978).

Grants active 1977-1978: Petroleum Research Fund, $9,000; Research Corporation Cottrell College Science Grant, with M. J. Tremelling, $15,000.

MUCCI, JOSEPH F. (b.1926) Professor. B.S., Central Connecticut State College, A.M., Wesleyan University, Ph.D., Yale University. *Physical Chemistry*. X-ray fluorescence spectroscopy; molecular orbital theory.

J. F. Mucci and P. J. Haskins, "Error Limits of Expectation Values in Quantum Mechanical Calculations," *Amer. J. Physics*, *41*, 987 (1973)

J. F. Mucci and M. A. Whitehead, "The Inversion of the NH_3 Molecule and Its Bond Length," *J. Chem. Soc.* *Faraday Trans.* *69*, 656 (1973).

J. F. Mucci, "On the Mathematical Form of DeBrogli's Cyclical Action Integral," *Foundations of Physics*, *4*, 91 (1974).

J. F. Mucci and R. L. Stearns, "Energy Dispersive X-Ray Fluorescence Analysis in Ion Exchange Studies," *J. Chem. Ed.*, *52*, 750 (1975).

J. F. Mucci and R. L. Stearns, "Use of Energy Dispersive X-Ray Fluorescence in Clay Materials," *Soil Science*, *123*, 264 (1977).

PARKER, LLOYD R., Jr. (b.1950) Assistant Professor. B.A., 1972, Berry College, M.S., 1974, Emory University, Ph.D., 1978, University of Houston. *Analytical Chemistry*. Simplex optimization of chemical methods, computer interfacing of chemical instrumentation.

L. R. Parker, Jr., S. L. Morgan, and S. N. Deming, "Simplex Optimization of Experimental Factors in Atomic Absorption Spectrometry," *Appl. Spectroscopy*, *29*. 429 (1975).

A. S. Olansky, L. R. Parker, Jr., S. L. Morgan and S. N. Deming, "Automated Development of Analytical Chemical Methods," *Anal. Chim. Acta.*, *95*, 107 (1977)

VASSAR COLLEGE

TREMELLING, MICHAEL J. (b.1945) Assistant Professor. B.A., 1968, Idaho State University, M.Phil., 1970, Yale University, Ph.D., 1972, Yale University. Physical Organic Chemistry. Elimination reactions, heterogeneous chemistry.

Seven publications, 1976-1978.

S. P. Hopper and M. J. Tremelling, "High Temperature Heterogeneous Reactions. II. Reactions at Silicon Centers," Syn. React. Metal-Org. Chem., 7:157 (1977).

S. P. Hopper, M. J. Tremelling, R. J. Ginsberg* and P. C. Mendelowitz,* "Heterogeneous Reactions. III. Evidence for an Alkoxide Induced 1,2-Hydride Shift from Silicon to Carbon under Heterogeneous Gas/Solid Phase Reaction". J. Organometal. Chem., 134, 173 (1977).

M. J. Tremelling, S. P. Hopper and J. Quirk,* "Heterogeneous Reactions. IV. The High Temperature Reduction of 3-Bromotricyclo $[2.2.1.0^{2,6}]$ Heptane with Sodium Methoxide." Tetrahedron Lett., 3119 (1977).

M. J. Tremelling, S. P. Hopper and P. C. Mendelowitz,* "Heterogeneous Reactions. V. The Anti Orientation of Elimination for the Dehydrobromination of meso and dl 2,3-Dibromobutane and E and Z 2-Bromobut-2-ene with Solid Potassium tertiary-Butoxide." Journal of Organic Chemistry, 43, 3076 (1978).

S. P. Hopper, M. J. Tremelling and E. W. Goldman,* "Heterogeneous Reactions. VI. Reactions of Trimethylchlorosilane, Dimethyldichlorosilane and Chloromethylchlorosilane with Potassium tertiary-Butoxide and Sodium Methoxide." J. Organomet. Chem, 156, 331 (1978).

Grants active 1977-1978: Petroleum Research Fund, $9,000; Research Corporation Cottrell College Science Grant, with S. P. Hopper, $15,000; Town of Poughkeepsie - Water Quality, $1,000.

WABASH COLLEGE

Crawfordsville, IN 47933

Fall 1978 ug enrollment 832

Degrees offered A.B.

Telephone (317) 362-1400 x 242

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 4 Grad. school 2 Industry 0 Professional schools 2 Other 0 .
4. Senior majors, average past five years: 8 .
5. Students involved in research, average past five years: Acad. yr. 6 Summer 2
6. National student honors, past five years (NSF fellowships, etc.)

   2 NSF fellowships

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 22,590 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

   MS (duPont 21-490)
   IR (P-E 457, Beckmann 8)
   NMR (Varian T-60)
   UV-Vis (B-L505, Beckmann DU with Gilford Modification, GCA/McPherson 700)
   AA (GCA/McPherson 700)
   GC (F-M 700)
   Aminco Stopped Flow Kinetics
   Nestor-Faust Spinning Band Distillation Column

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? No Total journal subscriptions? 30 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 9 .

4. Computer facilities: CAMPUS: PDP 11/45-RSTS/E.
   DEPARTMENT: Two PDP 11/20 with BASIC controlled on-line data acquisition.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: Faculty Development Fund, up to $2,500 has been awarded for individual research projects.
   Haines Research Fund, approx. $3,000/yr. for research projects.
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   DuPont College Science Grant, $6,500

3. Faculty teaching loads: Contact hours 10 Load credit for research? No

4. Sabbatical or leave support for research:

   Faculty may apply for sabbatical leave at 50% salary full year, full salary for 1/2 year, every seven years.

BUETTNER, GARRY R. (b. 1945) Assistant Professor. B.A., 1967, University of Northern Iowa (Cedar Falls), M.S., 1969, University of Iowa, Ph.D., 1976, University of Iowa. Physical Chemistry. Magnetic Resonance, Activated oxygen species in biological systems.

G. R. Buettner, L. W. Oberley, and S. W. H. C. Leuthauser, The Effect of Iron on the Distribution of Superoxide and Hydroxyl Radicals as seen by Spin Trapping and on the Superoxide Dismutase Assay, Photochemistry and Photobiology, 28, 693 (1979).

G. R. Buettner and L. W. Oberley, Considerations in the Spin Trapping of Superoxide and Hydroxyl Radical in Aqueous Systems Using 5,5-Dimethyl-1-Pyrroline-1-oxide, Biochemical Biophysical Research Communications, 83, 69 (1978).

G. R. Buettner and R. E. Corrman, EPR Determination of the Co (II)-Free Radical Magnetic Geometry of the "Doublet" Species Arising in a Coenzyme B-12-Enzyme Reaction, Biochimica et Biophysica Acta, 480, 495 (1977).

HADLEY, FRED J. (b. 1946) Visiting Assistant Professor. B.A., 1968, University of Kansas, Ph.D., 1977, Rice University. Physical Chemistry. Mass spectrometry and gas phase kinetics.

F. Hadley and J. L. Franklin, Energy and Angular Distributions of Fragment Ions of Nitrous Oxide, J. Chem. Phys., (To be published).

F. Hadley and J. L. Franklin, Iterative Deconvolution of Time-of-Flight Mass Peaks for the Determination of Translational Energies of Ions, Int. Journal of Mass Spec. and Ion Phys., 18, 249 (1975).

LENOX, RONALD S. (b. 1948) Assistant Professor. B.S., 1969, Juniata College, Ph.D., 1973, University of Illinois. Organic Chemistry. Synthetic organic chemistry and natural products with particular emphasis on insect chemistry.

R. S. Lenox and J. K. Crissman, Jr., Laboratory Manual for Organic Chemistry, Wadsworth Publishing Co. (To be published in Spring 1979). 11 Students helped to refine exercises.

R. S. Lenox, Electrons, Bonding, Orbitals and Light: A Unified Approach to the Teaching of Structure and Bonding in Organic Chemistry Courses, J. Chem. Educ., (To be published May, 1979).

R. S. Lenox, Exam Question Exchange, J. Chem. Educ., 54, 756 (1977).

•R. M. Einterz, •J. W. Ponder, and R. S. Lenox, Synthesis of 4-Methyl-3-heptanol and 4-Methyl-3-heptanone. Two Easily Synthesized Insect Pheromones., J. Chem. Educ., 54, 382 (1977).

•T. E. Stanberry, •M. J. Darmon, •H. A. Fry, and R. S. Lenox, Synthesis of 4-Lithio-2-methyl-2-pentene. A New Type of Allylic Organometallic Compound., J. Org. Chem., 41, 2052 (1976).

McKINNEY, PAUL C. (b. 1930) Professor and Chairman. A.B., 1952, Wabash College, Ph.D., 1958, Northwestern University. Theoretical Chemistry. Schrödinger equation for Burrau molecules, algebraic methods in quantum mechanics.

P. C. McKinney, On the Functions Associated with the Burrau Approximation for the Hydrogen Molecular Ion and Analogous Molecules, J. Chem. Phys., 66, 319 (1977).

PHILLIPS,DAVID A. (b. 1937) Associate Professor. B.S., 1958, University of Redlands, Ph.D., 1966, University of Washington. Inorganic Chemistry. Transition Metal Complexes, synthesis and reaction mechanisms.

D. A. Phillips, M. Kubota, and *J. A. Thomas, Reactions of Nitrosonium Salts with Complexes of Platinum, Inorg. Chem., 15, 118 (1976).

M. Kubota and D. A. Phillips, Oxygenation of the Nitrosyl Ligand in Complexes of Iridium, J. Am. Chem. Soc., 97, 5637 (1975).

D. A. Phillips, A. Microstate-Generating Computer Program, J. Chem. Educ., 50, 863 (1973).

ZIMMERMAN, JOHN F. (b. 1937) Associate Professor. B.S., 1959, State University of Iowa, Ph.D., 1964, University of Kansas. Analytical Chemistry. The computer-instrument interface, electroanalytical chemistry, and teaching methodology.

WELLESLEY COLLEGE

Wellesley, MA 02181

Fall 1978 ug enrollment 2114

Degrees offered B.A.

Telephone 617-235-0320, x339

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 10*. 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 1 3/4
3. 1978 seniors & their placement: Total 31+ Grad. school 3 Industry 0 Professional schools 13 Other 14 .
4. Senior majors, average past five years: 27 (including molecular biology)
5. Students involved in research, average past five years: Acad. yr. 12 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)
   James Flack Norris Summer Research Scholarship (ACS)

* Plus 2 full-time and 2 part-time laboratory instructors
+ 15 Chemistry and 16 Molecular Biology majors (an interdepartmental major in chemistry and biology)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 120,000 net % used for teaching 75 Research 25
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   - Perkin-Elmer R-32 90 MHz var. temp. NMR
   - Varian CFT-20 C^{13} NMR
   - IR (several)
   - UV vis (incl. GCA McPherson Model 707)
   - Varian Mass Spectrometer
   - Varian 142010 dual column GC
   - X-ray Diffractometer
   - Spinco L-250 and Sorvall Ultracentri.
   - High Pressure Liquid Chromatography
   - Beckman LS-150 Liquid Scintillation Counter
   - Perkin-Elmer 372 Atomic Absorption Spectrophotometer
3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 589* Computer literature search service? no Separate chemistry or science library? yes Librarian? yes Standing orders for review series and annual reviews (past five years) 250* . * Science Library: Astronomy, Biological Sciences, Chemistry, Computer Science, Geology Mathematics, Physics and Psychology.
4. Computer facilities:
   DECsystem-20 time-sharing computer, 12 CRT and 12 hard-copy terminals, 2 line-printers

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   Faculty Awards; $50/unit for each student doing independent study; necessary chem. glassware and equipment from dept. budget (such as NMR, AA, etc.)
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:
   DuPont College Science Grant, $6500
3. Faculty teaching loads: Contact hours 14 Load credit for research? no
4. Sabbatical or leave support for research:
   Yes - if outside support is not granted, Wellesley College will pay leave support.

CHANG, CHENG ALLEN. (b. 1952) Assistant Professor. B.S., 1974, National Taiwan University, Ph.D., 1978, University of Pittsburgh. Inorganic Chemistry. Inorganic stereochemistry and photochemistry.

Cheng A. Chang and Bodie E. Douglas, Stereochemical Studies of Cobalt(III) Complexes of Sexidentate Aminopolyacids Using Carbon-13 Chemical Shifts , Inorg. Chem., 18, in press, 1979.

Gary G. Hawn, Cheng A. Chang, and Bodie E. Douglas, Circular Dichroism and Carbon-13 Nuclear Magnetic Resonance Studies of Some Phenyl Substituted Ethylenediamine-N,N,N^1,N^1-tetraacetate Analogs , Inorg. Chem., 18, in press, 1979.

CRAWFORD, JEAN V. (b. 1919) Charlotte Fitch Roberts Professor of Chemistry and Chairman. A.B., 1940, Mt. Holyoke, A.M., 1942, Oberlin College, Ph.D., 1950, University of Illinois. Organic Chemistry. Synthesis of Some Substituted Ap_4A.

HEARN, MICHAEL J. (b. 1949) Assistant Professor. B.A., 1971, Rutgers College, M.S., 1973, Yale University, Ph.D., 1976, Yale University. Organic Chemistry. Synthesis and chemistry of novel unsymmetrically substituted acylhydrazines.

"Cyclobutanones from Cyclopropanone Precursors. Addition of Nitroalkanes to Cyclopropanone Aminals," H.H. Wasserman, M.J. Hearn, B. Haveaux and M. Thyes, J. Org. Chem., 41, 153 (1976).

Cyclopropanone--beta-Lactam Conversions via Hydroxylamines, H.H. Wasserman, E.A. Glazer and M.J. Hearn, Tetrahedron Lett., 49, 4855(1973).

HICKS, SONJA E. (b. 1940) Associate Professor. B.S., 1962, University of Maine, Ph.D., 1966, Indiana University Medical Center. Biochemistry. Nutritional studies of trace metals during stress (such as pregnancy and malignancies).

KAHL, STEPHEN B. (b. 1946) Assistant Professor. B.S., 1968, Duke University, Ph.D., 1972, Indiana University. Inorganic Chemistry. Synthesis and characterization of carboranyl estrogens.

G.M. Bodner, S.B. Kahl, K. Bork, B.N. Storhoff, J.E. Wuller and L.J. Todd, A Carbon-13 Study of Carbene Pentacarbonyl Complexes of Chromium (0) and Tungsten (0), Inorg. Chem., 12, 1071 (1973).

E.C. Alexander and S.B. Kahl, ^{40}Ar-^{39}Ar Ages and Trapped ^{40}Ar/^{36}Ar Ratios in Lunar Breccias 14301 and 14313, Proceedings of the Fifth Lunar Science Conference, April, 1974.

S.B. Kahl, D, Phinney and J.H. Reynolds, Rare Gas Dating of Apollo 16 and 17 Rocks, Meteoritics, 10, 88 (1975).

D.A. Leich, S.B. Kahl, A.R. Kirschbaum, S. Niemeyer and D. Phinney, Rare Gas Constraints on the History of Boulder 1, Station 2, Apollo 17, The Moon: An International Journal of Lunar Studies, 14, 407 (1975).

L.J. Todd, A.R. Siedle, G.M. Bodner, S.B. Kahl and J.P. Hickey, An NMR Study of Icosahedral Heteroatom Borane Derivatives, J. Mag. Resonance, 23, 301 (1976).

KOLODNY, NANCY H. (b. 1944) Assistant Professor. B.A., 1964, Wellesley College, Ph.D., 1969, Massachusetts Institute of Technology. Physical Chemistry. NMR studies of the interactions between and conformations of small biological molecules.

Gasparro, F.P. and Kolodny, N.H., NMR Determination of the Rotational Barrier in N,N-dimethylacetamide: A Physical Chemistry Experiment, J. Chem. Ed. 54, [illegible].

Kolodny, N.H., Neville, A.C.*, Coleman, D.L. and Zamecnik, P.C., Nuclear Magnetic Resonance Study of Interactions between tryptophan and dinucleoside phosphates at low pD, Biopolymers, 16, 259(1977).

LEVY, JUDITH T. (b. 1946) Assistant Professor. B.A., 1967, Goucher College, Ph.D., 1971, Johns Hopkins University School of Medicine. Biochemistry. 1) Interaction of metal ions with proteins and nucleic acids; thermodynamics of conformational transitions of proteins and nucleic acids, 2) Synthesis and physical characterization of synthetic polynucleotides; interaction of polynucleotides with serum nucleases.

Ts'o, P.O.P., Alderfer, J.L., Levy, J., Marshall, L.W., O'Malley, J., Horoszewicz, J.S., and Carter, W.A., An Integrated and Comparative Study of the Antiviral Effects and Other Biological Properties of the Polyinosinic Acid - Polycytidylic Acid and Its Mismatched Analogues , Molecular Pharmacology 12, 299 (1976).

LOEHLIN, JAMES H. (b. 1934) Professor. B.A., 1956, Wooster College, Ph.D., 1960, Massachusetts Institute of Technology. Physical Chemistry. Study of intermolecular interactions by means of x-ray crystallography.

J.H. Loehlin and E.B. Fleischer, Carbonate (1,4,7,10-tetraazacyclododecane) cobalt III perchlorate monohydrate , Acta Crystallographica, B32, 3063-66 (1976).

J.H. Loehlin and Å. Kvick, Tetraethylammonium Chloride Monohydrate , Acta Crystallographica, B34, in press (1978).

ROCK, ELIZABETH J. (b. 1924) Arthur J. and Nellie Z. Cohen Professor of Chemistry. B.S., 1946, College of Mount Saint Vincent, M.A., 1948, Smith College, Ph.D., 1951, Pennsylvania State University. Physical Chemistry. Use of Atomic Absorption Spectrophotometry in the analysis of ancient coins; Application of physical chemistry to conservation of stone monuments.

Rock, E.J. and Lewin, S.Z., "Chemical Considerations in the Cleaning of Stone and Masonry". The Conservation of Stone I. Part III. Edited by R. Rossi-Manaresi, pp. 343-368 (1975).

SWALLOW, KATHLEEN C. (b. 1948) Assistant Professor. B.S., 1970, Westhampton College, Ph.D., 1978, Massachusetts Institute of Technology. Analytical Chemistry. Characterization of Naturally Occuring Copper Complexing Organic Compounds.

Potentiometric Determination of Copper Complexation by Phytoplankton Exudates , Swallow, K.C., Westall, J.C., McKnight, D.M., Morel, N.M.L. and Morel, F.M.M., Limnology and Oceanography, 23(3), 538, (1978).

UMANS, ROBERT S. (b. 1941) Assistant Professor. B.S., 1962, Columbia University, M.S., 1963, Yale University, Ph.D., 1966, Yale University. Biochemistry. 1) Quantum Mechanical Studies of Mechanisms of Chemical Carcinogenesis, 2) Microsome-Induced Binding of Carcinogenic Hydrocarbons to Chromatin.

WEBSTER, ELEANOR R. (b. 1920) Professor. A.B., 1942, Wellesley College, A.M., 1944, Mt. Holyoke College, Ph.D., 1952, Radcliffe College. Organic Chemistry. 1) Synthesis of Diadenosine Polyphosphates, 2) Computer Programs for Organic Chemistry.

Maud H. Chaplin, Eleanor R. Webster, Dorothea J. Widmayer, A Viewer's Guide to The Ascent of Man, Wellesley College, Wellesley, MA., 1974 and 1975 (six volumes).

WHEATON COLLEGE

Wheaton, IL 60187

Fall 1978 ug enrollment 1960

Degrees offered B.S. or A.B.

Telephone 312-682-5064

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 6 . 2. Support staff: FTE's secretary 1 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 18 Grad. school 9 Industry 1 Professional schools 5 Other 3 .
4. Senior majors, average past five years: 18 .
5. Students involved in research, average past three years: Acad. yr. 6 Summer 3
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 29,500 % used for teaching 80% Research 5%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
   - NMR - Varian T60
   - U.V.-Vis - Beckman DK-2A, Beckman 25
   - AA - Varian 1200
   - G.C. - P.E. 881
   - I.R. - P.E. 337
   - Spinning Band Column - B/R 24T
   - Polarograph PAR 174A
   - Raman - Cary 81 modified
   - Beckman -Prep. UltraCentrifuge LS-50
   - Scintillation Counter-Beckman LS-100C
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 17 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 9 .
   Use John Crerar Library, Chicago
4. Computer facilities: Science Dept.: PDP 12, Two DEC 1103, CROMENCO microcomputer
   Campus PDP 11-45

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $4500 available
   Alumni Grants - 2 faculty
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts: None
3. Faculty teaching loads: Contact hours 13 Load credit for research? no
4. Sabbatical or leave support for research: Not available
   Alumni Grants available for research upon application-usually awarded for one quarter.

WHEATON COLLEGE

FACULTY PROFILE

BRACE, NEAL O. (b.1922) Professor. B.A., 1946, University of Minnesota, Ph.D., 1948, University of Illinois. Organic Chemistry. Free radical reactions of organic fluorine containing compounds. Mechanisms of reactions. Cyclization reactions. Surface activity of organic compounds.

(7) Martin Knell and Neal O. Brace, 3-Perfluoroalkyl-1-Propenes and Process for Producing. U.S. 3,843,735, Oct. 22, 1974.

N. O. Brace, Perfluoroalkythio Norbornane. U.S. 3, 989, 725, Nov. 2, 1976.

N. O. Brace, Cyclization during the Dehydrohalogenation of Perfluoroalkyl-Substituted Iodoalkylmalonates. Thermal Rearrangement of the Derived 2-(Perfluoroalkyl) methylcyclopropane-1,1-dicarboxylates. J. Org. Chem., 40, 851 (1975).

N. O. Brace and *James E. Van Elswyk, Evidence for Free Radical Reductive Dehalogenation in Reaction of Zinc and Acid with 1-Perfluoroalkyl-2-Iodoalkanes and with 1-Perfluoroalkyl-2-Iodoalkenes, J. Org. Chem., 41, 766 (1976).

N. O. Brace, Syntheses with F-Alkyl Radicals from F-Alkyl Iodides: Amine and Amine Salt Induced Addition to Alkenes, J. Org. Chem., (1978).

CHIGNELL, DEREK A. (b. 1943) Assistant Professor. B.S., 1964, King's College, University of London, England, Ph.D. 1968, King's College, University of London, England, M.A., 1977, Wheaton College, Wheaton, Illinois (communications). Chemistry, Biochemistry. Biochemistry of Vision, Electron Transport in Mitochondria.

C. F. Chignell and D. A. Chignell, A Spin-Label Study of Purple Membranes from Halobacterium Halobium, Biochem. Biophys. Res. Comm. 62, 136 (1975).

'Proteins', a chapter in the book, Biochemistry and Physiology by Bell, Davidson and Smith, ed. by C. R. Paterson, Longmans (1976).

D. Macqueen, D. A. Chignell, G. J. Dutton & P. B. Garland, Biochemistry for medical students: a flexible student-oriented approach, Medical Education, 10, 418 (1976).

An Audiotutorial Laboratory for Biochemistry, Nuffield Foundation Group for Research and Innovation in Higher Education, Newsletter No. 6, October 1975.

FIESS, HAROLD A. (b. 1917) Professor, Department Chairman. B.S., 1939, Wheaton College, M.S., Ph.D., 1944, University of Illinois, Urbana. Analytical Chemistry. Analytical electrochemistry, trace analysis.

FUNCK, LARRY L. (1942) Associate Professor. B.S., 1964, Lebanon Valley College, Ph.D., 1969, Lehigh University. Inorganic Chemistry. Metal complex equilibria, electronic spectra of metal complexes, bioinorganic chemistry.

HUNG, NARL C. (b. 1935) Associate Professor. B.S., 1956, National Cheng-Kung University, M.A., 1959, Wellesley College, Ph.D., 1962, University of Rochester. Physical Chemistry. Energy Transfer in Gas Kinetics, Ab initio Molecular Orbital Calculation, Computer Application and Instruction in Chemistry.

Narl C. Hung, Survey of Evaluation and Gradings in Undergraduate Chemistry, J. Chem. Ed., 53, 565 (1976).

NIEMCZYK, MARK P. (b. 1946) Assistant Professor. B.A., 1968, SUNY at Buffalo, Ph.D., 1972, Columbia, Physical Organic Photochemistry. Physical organic photochemistry, synthesis, strained molecules.

M. Niemczyk, N. Schore, N. J. Turro, A Correlation Between the Rate Constant for Fluorescence Quenching and Charge Transfer Phenomena, Mol. Photochem.,5, 69 (1973).

WHITMAN COLLEGE

Walla Walla, WA. 99362

Fall 1978 ug enrollment 1167

Degrees offered B.A.

Telephone (509) 527-5111

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 4 . 2. Support staff: FTE's secretary 1/4 Stockrm 1/2 Technician 1/4
3. 1978 seniors & their placement: Total 10 Grad. school 1 Industry 0 Professional schools 4 Other 5 .
4. Senior majors, average past five years: 9 .
5. Students involved in research, average past five years: Acad. yr. 4 Summer 1
6. National student honors, past five years (NSF fellowships, etc.)

None

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 9600 % used for teaching 85 Research 15 .
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

AA (P-E 303)
GC (Varian A90-P3)
IR (P-E 21, PE 237-B)
NMR - 60 MH$_z$ (P-E R24A)
UV-Vis (Beckman DK-2A, Beckman DU)
Electrochemical Equipment (Heathkit modular-polarography, amperometry, coulometry)
Scintillation counter (Nuclear Chicago Unilux)

3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 17 Computer literature search service? No Separate chemistry or science library? No Librarian? No Standing orders for review series and annual reviews (past five years) 8 .
   Also: Science Citation Index (1975-present).
4. Computer facilities: Hewlett-Packard 3000 Series II Model 8 time share system with remote terminal (CRT and keyboard) in chemistry department; 300 line per min printer in physics department; high speed printers and four-color plotter in

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:
   $300 for faculty research - chemicals and supplies; $500 for student research projects - chemicals and supplies
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

   None
3. Faculty teaching loads: Contact hours 14 Load credit for research? No
4. Sabbatical or leave support for research:

   Faculty can apply for sabbatical leave at 75% salary for full year or full salary for 1/2 year. Frequency averages every 7th year.

WHITMAN COLLEGE

FACULTY PROFILE

FRASCO, DAVID L. (b. 1931) Professor. B. A.,1953, Northern Colo. University M.S., 1955, Washington State University, Ph. D., 1958, Washington State University. Physical Chemistry. Infrared Spectra of Solids, Electrical & Physical properties of Lipid Bilayers.

D. R. Kalhwarf and D. L. Frasco, Lysis of Phospholipid Membranes with Radiation-Induced Free Radicals. Radiation Research, 70,647 (1977).

Grant active 1977-1978. Battelle Research Institute, $10,000, Physical and Electrochemical Properties of Artificial Lipid Bilayers.

TODD, JAMES S. (b. 1935) Professor. B.A., 1957, Pomona College, Ph.D., 1961, University of Rochester. Organic Chemistry. Natural products.

TEMPLETON, J. CHARLES (b. 1943) Associate Professor and Chairman. B. A., 1965, College of Wooster, M. A., 1967, Wesleyan University, Ph.D., 1970, University of Colorado. Inorganic and Analytical Chemistry. Kinetics and mechanisms of reactions of transition metal complexes in aqueous solution; studies in concentrated acid media.

R. E. Hamm and J. C. Templeton, "Kinetics of the Reaction of the 1,2-Diaminocyclohexanetetraacetatomanganate(III) Anion with Cyanide Ion", Inorg. Chem., 12, 755 (1973).

J. C. Templeton, "A Temperature-Regulated Cell Holder for the Beckman DK-2A Spectrophotometer", J. Chem. Educ., 50, 483 (1973).

RHODES, W. GALE (b. 1943) Assistant Professor. B. S., 1965, North Carolina State University, Ph. D., 1971, University of North Carolina. Bio-organic Chemistry. Chemical evolution, origin of proteins.

W. G. Rhodes,*R. Smock and*L. Brown, Ever-more-Sophisticated Lies About Bonding: A Minicourse in HMO Theory for Undergraduates. J. Chem. Educ., 54, 687 (1977).

W. G. Rhodes,*W. H. Flurkey and*R. M. Shipley, Thermal Proteinoids: A Project in Molecular Evolution for the Undergraduate Biochemistry Laboratory, J. Chem. Educ., 52, 197 (1975).

W. G. Rhodes and*L. Brown, Determination of the Coefficients of HMO Wave Functions: A Computer Program in the BASIC Language., J. Chem. Educ., 51, 595 (1974).

R. G. Hiskey, V. R. Rao and W. G. Rhodes, Methods for the Protection of Thiols, in Protective Groups in Organic Chemistry, J. F. W. McOmie, Ed., London: Plenum Press, pp. 235-308 (1973).

M. S. Rohrbach, B. A. Humphries, F. J. Yost, Jr., W. G. Rhodes, S. Boatman, R. G. Hiskey and J. H. Harrison, The Reaction of 4,4'-Bis-(dimethylamino)-diphenylcarbinol with the Sulfhydryl Group: A New Reagent for Sulfhydryl Analysis. Analytical Biochemistry, 52, 127 (1973).

WILLIAMS COLLEGE
Williamstown, MA 01267

Fall 1978 ug enrollment 2008
Degrees offered A.B.
Telephone (413) 597-2323

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 10 . 2. Support staff: FTE's secretary 2 Stockrm 1 Technician 0
3. 1978 seniors & their placement: Total 43 Grad. school 6 Industry 6 Professional schools 25 Other 6 .
4. Senior majors, average past five years: 29 .
5. Students involved in research, average past five years: Acad. yr. 12 Summer 4
6. National student honors, past five years (NSF fellowships, etc.)

   1 NSF predoctoral fellowship

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 35,000 % used for teaching 80% Research 20%
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)

NMR	P-E R12B	GC	Varian 1420, Varian 1860
IR	P-E 237B	Polarimeter	P-E 241
UV-VIS	Cary 219, Cary 14	Ultracentrifuge	Beckman L
ESR	Varian E-3		
LC	Waters 202/401		

3. Library resources: Chem. abstracts? yes Volume indices? yes Collected indices? yes Total journal subscriptions? 43 Computer literature search service? no Separate chemistry or science library? yes Librarian? no Standing orders for review series and annual reviews (past five years) 32 .
4. Computer facilities: Univac 1100/10, IBM 1130, DEC 11-10

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research:

   Approx. $9000/yr. for apparatus and chemicals.

2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

Du Pont College Science Grant	$6,500
Alcoa Foundation	6,300

3. Faculty teaching loads: Contact hours 11 Load credit for research? no
4. Sabbatical or leave support for research:
   sabbatical leave (tenured faculty): 75% salary full yr., 100% salary half yr., every 7th yr.; or 75% salary half yr., every 4th yr.
   assistant prof. leave (nontenured): 100% salary half yr.; once during 2nd appnt..

CHANDLER, DEAN W. (b. 1944) Assistant Professor. B.S., 1967, Harvard University, Ph.D., 1973, Northwestern University. Physical and Analytical Chemistry. Spectroscopy.

L. Wharton, R. E. Smalley, D. H. Levy, and D. W. Chandler, Van der Waals Complexes of Tetrazine, J. Chem. Phys., 68, 2487 (1978).

D. W. Chandler, L. Wharton, R. E. Smalley, and D. H. Levy, Nozzle Jet Spectroscopy of Tetrazine, J. Mol. Spectry., 66, 375 (1977).

D. W. Chandler, A Note on Single Photon Fluorimetry, Rev. Sci. Instrum., 46, 786 (1975).

CHANG, RAYMOND (b. 1939) Professor. B.Sc., 1962, London University, Ph.D., 1966, Yale University. Physical Chemistry. Magnetic resonance, chemical kinetics and protein conformation.

Twelve publications, 1973-1978.

R. Chang, *D. G. Kehres, and J. H. Markgraf, The Configuration of the Thioindigo Anion Radical, J. Org. Chem., 38, 1608 (1973).

D. K. Chu, R. Chang, and L. E. Vickery, An Electron Paramagnetic Resonance Study of the Binding of Manganese to Ribulose-1,5-Diphosphate Carboxylase, Biochem. Biophys. Acta, 334, 438 (1974).

R. Chang and W. R. Moomaw, Phosphorescence and Electron Paramagnetic Resonance Study of a Photoexcited Triplet State: Advanced Undergraduate Experiment in Molecular Physics, Am. J. Phys., 44, 455 (1976).

R. Chang, *S. M. Vlasak, and J. H. Markgraf, Electron Spin Resonance Study of an Unusually Tight Ion-Pair, Chem. Commun., 682 (1977).

R. Chang, Physical Chemistry With Applications to Biological Systems, Macmillan Publishing Co., New York, 1977.

KAPLAN, LAWRENCE J. (b. 1943) Associate Professor. B.S., 1964, University of Pittsburgh, Ph.D., 1970, Purdue University. Biochemistry. Purification and characterization of plasma proteins, coagulation factor IX and albumin; environment of amino acid residues in proteins as a function of conformation.

Seven publications, 1973-1978.

*C. N. Cornell and L. J. Kaplan, Spin-Label Studies of the Sulfhydryl Environment in Bovine Plasma Albumin II. The Neutral Transition and the A Isomer, Biochemistry, 17, 1755 (1978).

*C. N. Cornell and L. J. Kaplan, Spin-Label Studies of the Sulfhydryl Environment in Bovine Plasma Albumin I. The N-F Transition and Acid Expansion, Biochemistry, 17, 1750 (1978).

D. M. Quadaguo, *S. Albelda, T. E. McGill, and L. J. Kaplan, Intracranial Cycloheximide: Effect on Male Mouse Sexual Behavior and Plasma Testosterone, Pharmacology, Biochemistry and Behavior, 4, 185 (1976).

*H. Hull, R. Chang, and L. J. Kaplan, Probing the Site of the Sulfhydryl Residue in Plasma Albumin by Spin-Labeling, Biochim. Biophys. Acta., 400, 132 (1975).

J. F. Brandts and L. J. Kaplan, Derivative Spectroscopy Applied to Tyrosyl Chromophores. Studies on Ribonuclease, Lima Bean Inhibitors, Insulin and Pancreatic Trypsin Inhibitor, Biochemistry, 12, 2011 (1973).

KLEIER, DANIEL A. (b. 1945) Assistant Professor. B.A., 1967, Bellarmine College, Ph.D., 1971, University of Notre Dame. Physical and Theoretical Chemistry. Molecular orbital calculations, dynamic nmr spectrometry.

Seventeen publications, 1973-1978.

D. A. Dixon, D. A. Kleier, and W. N. Lipscomb, Localized Molecular Orbitals for Polyatomic Molecules. 6. Condensed Aromatic Ring Systems, J. Am. Chem. Soc., 100, 5681 (1978).

KLEIER, DANIEL A., cont'd

D. A. Kleier, D. A. Dixon, and W. N. Lipscomb, Fluxional Behavior in $B_{11}H_{11}^{2-}$. A Theoretical Study, Inorg. Chem., 17, 166 (1978).

K. A. Jewett and D. A. Kleier, A Fortran Program for Plotting Dot Diagrams of Electron Density, J. Chem. Educ., 55, 451 (1978).

T. A. Halgren, L. D. Brown, D. A. Kleier, and W. N. Lipscomb, Apparent Octet Rule Violations, Fractionality, and the Interpretation of Localized Molecular Orbital Structures. Polarization and Hybridization Functions in Chemical Bonding, J. Am. Chem. Soc., 99, 6793 (1977).

D. A. Dixon, D. A. Kleier, T. A. Halgren, J. H. Hall, Jr., and W. N. Lipscomb, Localized Molecular Orbitals for Polyatomic Molecules. 5. The Closo Boron Hydrides $B_nH_n^{2-}$ and Carboranes $C_2B_{n-2}H_n$, J. Am. Chem. Soc., 99, 6226 (1977).

MARKGRAF, J. HODGE (b. 1930) Professor and Chairman. A.B., 1952, Williams College, M.S., 1954, Ph.D., 1957, Yale University. Organic Chemistry. Synthesis and mechanisms of heterocyclic systems.

Nine publications, 1973-1978.

J. H. Markgraf and *M. F. Anton, Solvolysis of 1-Haloadamantanes, J. Chem. Educ., 54, 773 (1977).

J. H. Markgraf, *M. S. Ibsen, *J. B. Kinney, *J. W. Kuper, *J. B. Lurie, *D. R. Marrs, *C. A. McCarthy, *J. M. Pile, and *T. J. Pritchard, Decarbalkoxylation of Isohexylmalonates, J. Org. Chem., 42, 2631 (1977).

J. H. Markgraf, *S. R. Berryhill, *L. R. Groden, *W. M. Hensley, *G. G. Spence, and W. J. McMurray, The Reaction of Diphenyl-2-pyridylmethyl N-Oxide with Acetic Anhydride, J. Org. Chem., 40, 417 (1975).

J. H. Markgraf, *W. M. Hensley, and *L. I. Shoer, Dissolving Metal Reductions of Benzylic Esters, J. Org. Chem., 39, 3168 (1974).

C. W. Koch, R. M. Milberg, *R. J. Katt, J. H. Markgraf, and *P. M. Wege, The Mass Spectral Fragmentations of Some Arylquinolines and Quinoline N-Oxides, J. Heterocycl. Chem., 11, 475 (1974).

MOOMAW, WILLIAM R. (b. 1938) Professor. B.S., 1959, Williams College, Ph.D., 1965, Massachusetts Institute of Technology. Physical Chemistry. Electronic spectroscopy and theory of small organic molecules, molecular complexes, the radiative and radiationless deactivation of electronic excited states.

Seven publications, 1973-1978.

*M. F. Anton and W. R. Moomaw, Luminescence and Hydrogen Bonding in Quinoline and Isoquinoline, J. Chem. Phys., 66, 1808 (1977).

W. R. Moomaw and *M. F. Anton, Luminescence Studies of Proton Transfer in the Excited Electronic States of Hydrogen Bonded Quinoline and Isoquinoline, J. Phys. Chem., 80, 2243 (1976).

R. Chang and W. R. Moomaw, A Phosphorescence and Electron Paramagnetic Resonance Study of a Photoexcited Triplet State, Am. J. Phys., 44, 455 (1976).

M. A. El-Sayed, W. R. Moomaw, and J. B. Chodak, The Mechanism of the $S_1 \rightsquigarrow T_1$ Intersystem Crossing Process in Aromatic Hydrocarbons from PMDR, Chem. Phys. Lett., 20, 11 (1973).

*W. R. Wadt and W. R. Moomaw, The Role of $d\pi$ Orbitals in Spin Orbit Coupling, Mol. Phys., 25, 1291 (1973).

Dreyfus Teacher-Scholar, $20,000.

RICCI, JOHN S., JR. (b. 1940) Visiting Assistant Professor. A.B., 1962, American International College, M.A., 1963, Columbia University, Ph.D., 1969, S.U.N.Y. at Stony Brook. Physical and Inorganic Chemistry. Structural chemistry of transitory metal complexes and organo-phosphates.

Nine publications, 1973-1978.

RICCI, JOHN S., JR., cont'd

F. Ramirez, J. S. Ricci, Jr., et al., Crystal and Molecular Structure of Phosphates. 8., J. Org. Chem., 43, 3635 (1978).

F. Ramirez, J. S. Ricci, Jr., et al., Crystal and Molecular Structure of a Furanose Five-Membered Cyclic Phosphodiester, J. Am. Chem. Soc., 99, 5135 (1977).

F. Ramirez, J. S. Ricci, Jr., et al., Crystal and Molecular Structure of trans-Biphthalyl, $C_{16}H_8O_4$, J. Org. Chem., 41, 3909 (1976).

J. S. Ricci, Jr., et al., Crystal and Molecular Structure of a Five-Membered Cyclic Unsaturated Pyrophosphate, $P_2O_7C_8H_{12}$, J. Am. Chem. Soc., 97, 5457 (1975).

H. L. Carrell, H. M. Berman, J. S. Ricci, Jr., et al., Crystal and Molecular Structure of a Caged Polycyclic Tetraoxycarbophosphorane, J. Am. Chem. Soc., 97, 38 (1975).

SKINNER, JAMES F. (b. 1940) Professor. B.A., 1961, Williams College, Ph.D., 1964, Yale University. Physical Chemistry Electrochemistry, inorganic chemistry.

*J. B. Kinney and J. F. Skinner, A Device for Easy Demonstration of Optical Activity and Optical Rotatory Dispersion, J. Chem. Educ., 54, 494 (1977).

J. F. Skinner, Electrochemical Demonstration: Motor Driven by a Simple Galvanic Cell, J. Chem. Educ., 54, 619 (1977).

J. F. Skinner and J. H. Markgraf, Dipole Moments and Molecular Conformations of Some Thioanhydrides, J. Molecular Structure, 28, 177 (1975).

TAYLOR, ALLEN (b. 1946) Assistant Professor. B.S., 1967, The City College of CUNY, Ph.D., 1973, Rutgers University. Biochemistry, bio-organic chemistry, investigations on the active site, mechanism of action and physiological role of leucine aminopeptidase.

F. Jurnak, A. Rich, L. von Loon Klaassen, H. Bloemendahl, A. Taylor, and F. H. Carpenter, Preliminary X-Ray Study of Leucine Aminopeptidase (Bovine Lens), An Oligomeric Metalloenzyme, J. Mol. Biol., 110, 149 (1977).

WARREN, HAROLD H. (b. 1922) Professor. B.S., 1944, University of New Hampshire, M.S., 1947, Ph.D., 1950, Princeton University. Organic Chemistry. Synthesis of natural products and structural variants.

THE COLLEGE OF WOOSTER

Wooster, OH 44691

Fall 1978 ug enrollment 1,827

Degrees offered B.A.

Telephone (216) 264-1234, Ext. 418 or 437

DEPARTMENT PROFILE

Student, Faculty & Staff Base

1. Faculty: FTE 8 . 2.Support staff: FTE's secretary 1.5 Stockrm 1 Technician .5
3. 1978 seniors & their placement: Total 30 Grad. school 10 Industry 11 Professional schools 1 Other 8 .
4. Senior majors, average past five years: 28 .
5. Students involved in research, average past five years: Acad. yr. 28 Summer 7
6. National student honors, past five years (NSF fellowships, etc.)

Facility, Library and Equipment Base

1. Bldg. space: Ft^2 25,000 % used for teaching 80 Research 20
2. Instrumentation: List up to 10 major instr. available for ug research (NMR, IR, etc.)
    1) Beckman 700 Raman spectrometer
    2) Cary 14 spectrophotometer
    3) Jarrell-Ash DIAL-ATOM II atomic absorption/flame emission spectrometer
    4) PAR 174 polarographic analyzer
    5) Hewlett-Packard 5830 gas chromatograph
    6) Beckman Spinco 120C amino acid analyzer
    7) Varian T-60 nuclear magnetic resonance spectrometer
    8) Cary 60 spectropolarimeter
    9) Perkin-Elmer 283 infrared spectrometer
3. Library resources: Chem. abstracts? Yes Volume indices? Yes Collected indices? Yes Total journal subscriptions? 66 Computer literature search service? No Separate chemistry or science library? Yes Librarian? No Standing orders for review series and annual reviews (past five years) 17 .
4. Computer facilities: Connected to computer center at Battelle Memorial Institute (CDC 6600, CYBER 73); also Digital Equipment PDP-11 minicomputer.

Support Base (1977-78 acad. yr. - 1978 summer)

1. Internal support for research: $6,000
2. Departmental grants (list Dreyfus, Du Pont, NSF-URP, NSF, ISEP, etc.) along with dollar amounts:

    NSF-URP, $8,310; NSF-ISEP, $10,900; Du Pont, $6,500
3. Faculty teaching loads: Contact hours 11* Load credit for research? No (but credit is given for supervising student research)
4. Sabbatical or leave support for research:

    Research leave every fifth year at full salary.

*Does not include senior research supervision.

FACULTY PROFILE

POWELL, DAVID L. (b.1936) Professor and Chairman. B.A., 1958, Oberlin; Ph.D., 1962, Wisconsin. Physical Chemistry. Vibrational spectroscopy, conformational analysis.

Eighteen publications, 1973-1978.

D. L. Powell and P, Klaboe, Conformation and Vibrational Spectra of 1,1,2-Trichloro-2,3,3-trifluorocyclobutane, *Acta Chem. Scand.*, *A 32*, 71 (1978).

D. L. Powell, P. Klaboe, B. N. Cyvin, and H. Hopf, Conformation and Vibrational Spectra of 1-Bromo-1,5-hexadiyne (1-Bromobipropargyl), *J. Mol. Struct.*, *43*, 193 (1978).

D. L. Powell, J. E. Gustavsen, P. Klaboe, and C. J. Nielsen, Raman and Far Infrared Spectra and Conformation of 1,2-Diiodotetrafluoroethane, *J. Raman Spectrosc.*, 7, 111 (1978).

D. L. Powell, P. Klaboe, A. Phongsatha, B. N. Cyvin, S. J. Cyvin, and H. Hopf, Conformation and Vibrational Spectra of 1,5-Hexadiyne (Bipropargyl), *J. Mol. Struct.*, *41*, 203 (1977).

D. L. Powell, P. Klaboe, B. N. Cyvin, and H. Hopf, Conformation and Vibrational Spectra of 1,6-Dibromo-1,5-hexadiyne (1,6-Dibromobipropargyl), *J. Mol. Struct.*, *41*, 215 (1977).

BORDERS, CHARLES L., JR. (b. 1942) Associate Professor. B.A., 1964, Bellarmine; Ph.D., 1968, California Institute of Technology. Biochemistry. Protein chemistry, chemical modification of proteins; the roles of various amino acid residues at enzyme active sites, especially the role of arginine; development of new reagents for the chemical modification of proteins.

Nine publications, 1973-1978.

C. L. Borders, Jr., M. L. Woodall*, and A. L. George, Jr.*, Essential Arginyl Residues in Yeast Enolase, *Biochem. Biophys. Res. Comm.* *82*, 901 (1978).

C. L. Borders, Jr., K. L. Cipollo*, J. F. Jorkasky*, and K. E. Neet, The Role of Arginyl Residues in Yeast Hexokinase PII, *Biochemistry* *17*, 2654 (1978).

C. L. Borders, Jr., L. J. Pearson*, A. E. McLaughlin*, J. Vasiloff*, M. E. Gustafson*, and D. J. Morgan*, Chromophoric Arginine Reagents, *Fed. Proc.* *37*, 1510 (1978).

J. F. Riordan, K. D. McElvany* and C. L. Borders, Jr., Arginyl Residues: Anion Recognition Sites in Enzymes, *Science* *195*, 884 (1977).

C. L. Borders, Jr., and B. A. Wilson*, Phosphoglycerate Mutase Has Essential Arginyl Residues, *Biochem. Biophys. Res. Comm.* *73*, 978 (1976).

Grants active 1977-78: PRF Type B, $13,000, Chromophoric arginine reagents.

BROMUND, RICHARD H. (b. 1940) Associate Professor. B.A., 1962, Oberlin; Ph.D., 1968, Pennsylvania State. Analytical Chemistry. Water quality, oceanography.

M. L. Nicholas*, D. L. Powell, T. R. Williams and R. H. Bromund, Reference Raman Spectra of DDT and Five Structurally Related Pesticides and of Five Pesticides Containing the Norbornene Group, *J. Assn. of Official Analytical Chemists*, *59*, 197 (1976).

R. H. Bromund, N. W. Bower* and R. H. Smith, Inclusion in Ancient Ceramics; An Approach to the Problem of Sampling for Chemical Analysis, *Archaeometry* *18*, 218 (1976).

N. W. Bower*, R. H. Bromund, and R. H. Smith, Atomic Absorption for the Archaeologist: An Application to Pottery from Pella of the Decapolis, *J. Field Archaeometry* *2*, 389 (1975).

GAUS, PAUL L. (b. 1949) Assistant Professor. B.S., 1971, Miami University (Ohio); Ph.D., 1975, Duke University. Inorganic Chemistry. The synthesis of pentaammine complexes of cobalt; electron transfer reactions of transition metal compounds; infrared and NMR spectroscopy as probes of the *trans* effect in octahedral complexes.

Ten publications, 1973-1978.

P. L. Gaus, A. Haim, and F. Johnson, Synthesis of Bis(4-pyridyl)-methane, *J. Org. Chem.*, *42*, 564 (1977).

P. L. Gaus and A. L. Crumbliss, Carbon-13 Nuclear Magnetic Resonance Spectra of Cyanocobaloximes Containing Carbon-13-labeled Cyanide, *Inorg. Chem.*, *15*, 739 (1976).

P. L. Gaus and A. L. Crumbliss, Synthesis and Characterization of Neutral Cyano-Bridged Dicobaloximes. (Alkyl)-cobaloxime-μ-cyano-(ligand) cobaloxime, *Inorg. Chem.*, *15*, 2080 (1976).

A. L. Crumbliss and P. L. Gaus, Intermolecular Hydrogen Bonding in Protonated Diacidocobaloximes, *Inorg. Chem.*, *14*, 2745 (1975).

A. L. Crumbliss and P. L. Gaus, Synthesis and Characterization of Protonated Alkylcobaloximes and Related Compounds, *Inorg. Chem.*, *14*, 486 (1975).

HAYNES, LEROY W. (b. 1934) Professor. B.A., 1956, Drew University, Ph.D., 1961, University of Illinois. Organic Chemistry. Synthesis of heterocyclic compounds, isolation and characterization of natural products.

Twelve publications, 1973-1978.

T. Eisner, D. F. Wiemer, L. W. Haynes, and J. Meinwald, Lucibufagins: Defensive Steriods from the Fireflies *Photinus ignitus* and *P. marginellus*, *Proceedings of the National Academy of Sciences*, *75*, 905 (1978).

L. W. Haynes and D. L. Powell, Creative Chemistry, *Teacher*, *94*, 112 (1977).

R. Pettit and L. W. Haynes, Carbonium Ions Pi-complexed to Metal Atoms, *Carbonium Ions*, *Vol. 5*, 2263 (1976).

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KIEFFER, WILLIAM F. (b. 1915) Professor. B.A., 1936, Wooster; M.Sc., 1938, Ohio State University; Ph.D., 1940, Brown. Physical Chemistry. Photochemistry; radiation chemistry; chemical education.

William F. Kieffer, Chemistry Today, Canfield Press (1976).

REINHEIMER, JOHN D. (b. 1920) Professor. A.B., 1942, Kenyon College, M.A., Ph.D., 1944, 1949, Johns Hopkins University. Organic Chemistry. Reaction rates, protein modification reagents.

K. Gatto, J. D. Reinheimer, K. Shafer, and J. T. Gerig; Analysis of the P.M.R. Spectrum of α-Tetralone, Org. Magnetic Resonance, 6, 577-579 (1974).

J. T. Gerig and J. D. Reinheimer, Modification of Human Serum Albumin with Trifluoromethyl-Substituted Aryl Halides and Sulfonates, J. Am. Chem. Soc. 97, 168 (1975).

J. T. Gerig, K. E. Katz* and J. D. Reinheimer, Reactions of 2,6-Dinitro-4-trifluoromethylbenzenesulfonate with Human Serum Albumin, Biochim. Biophys. Acta, 534, 196 (1978).

WILLIAMS, THEODORE R. (b. 1930) Professor. B.S., 1952, Howard University; M.S., 1954, Pennsylvania State University; Ph.D., 1960, University of Connecticut. Analytical Chemistry.

Eight publications, 1973-1978.

T. R. Williams and L. W. Haynes, An Experiment in the Characterization of Coordination Compounds, J. Chem. Ed., 54, 246 (1977).

M. L. Nicholas*, D. L. Powell, T. R. Williams, R. Q. Thompson*, and N. H. Oliver*, Reference Raman Spectra of Eleven Miscellaneous Pesticides, J. Assoc. Off. Anal. Chem., 59, 1266 (1976).

M. L. Nicholas*, D. L. Powell, T. R. Williams, and S. R. Huff*, Reference Raman Spectra of Ten Phosphorus-Containing Pesticides, J. Assoc. Off. Anal. Chem., 59, 1071 (1976).

M. L. Nicholas*, D. L. Powell, T. R. Williams, and R. H. Bromund, Reference Raman Spectra of DDT and Five Structurally Related Pesticides and of Five Pesticides Containing the Norbornene Group, J. Assoc. Off. Anal. Chem., 59, 197 (1976).

T. R. Williams, D. R. Foy* and C. Benson, The Determination of Zinc in Human Eye Tissues by Anodic Stripping Voltammetry, Anal. Chim. Acta. 75, 250-252 (1975).

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Bigler, W.N., Rochester Inst. of Tech.
Blair, L.K., Berea C.
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Blankespoor, R.L., Calvin C.
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Bock, C.W., Phil. C. of Tex. & Sci.
Bondurant, C.W., Jr., Roanoke C.
Borders, C.L., Jr., Wooster, The C. of
Bordley, J.L., Jr., South, The U. of
Borkowski, R.P., King's C.
Bosch, A.J., Central C., (IA)
Bower, N.W., Colorado C., The
Bowers, P.G., Simmons C.
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Boyer, R.F., Hope C.
Boykins, D.W., Jr., Agnes Scott C.
Boyles, J.G., Bates C.
Brace, N.O., Wheaton C.
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Brown, J.B., Denison U.
Brown, J.E., Holy Cross, C. of the
Brown, L.E., Drake U.
Brown, W.H., Beloit C.
Bryan, H.A., Davidson C.
Buettner, G.R., Wabash C.
Burke, J.A., Trinity C.
Burnett, J.N., Davidson C.
Butcher, S.S., Bowdoin C.
Byers, B.H., Holy Cross, C. of the

Camp, D.B., South, The U. of
Campbell, J.A., Harvey Mudd C.
Capp, G., Seattle Pacific C.
Carlin, C.H., Carleton C.
Carlson, J.L., Macalester C.
Carlson, R.E., Pacific Lutheran U.
Carlton, T.S., Oberlin C.
Carr, D.T., Coe C.
Carroll, F.A., Davidson C.
Celikiz, G., Phil. C. of Tex. & Sci.
Champion, W., Colorado C., The
Chandler, D.W., Williams C.
Chang, C.A., Wellesley C.
Chang, R., Williams C.
Chapman, S., Barnard C.
Charola, A.E., Manhattan C.-C. of Mt. St. Vincent
Chesick, J.P., Haverford C.
Chignell, D.A., Wheaton C.
Child, W.C., Jr., Carleton C.
Christensen, C.G., Trinity U.
Christensen, R.L., Bowdoin C.
Christensen, V.J., Point Loma U.

Chudd, C.C., Dayton, U. of
Church, L.B., Reed C.
Clark, P.A., Vassar C.
Cleland, G.H., Occidental C.
Clemens, D.G., Goshen C.
Clough, S.C., Richmond, U. of
Clyde, D.D., Trinity U.
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1967-1976			1920-1976	
Rank	Number	Institution	Rank	Number
1	63	Oberlin C/OH	1	286
2	62	Manhattan C/NY	10	113
3	60	Hope C/MI	2	166
4	57	Wooster, C of/OH	6	147
5	47	Canisius C/NY	20	95
"	47	St. Olaf C/MN	4	156
7	45	Bucknell U/PA	24	86
"	45	DePauw U/IN	5	155
"	45	Franklin & Marshall C/PA	3	161
10	43	Lafayette C/PA	14	101
11	41	Juniata C/PA	11	109
12	40	St. Peters C/NJ	40	71
"	40	Union C/NY	7	139
14	39	Harvey Mudd C/CA	93	42
"	39	Holy Cross, C of/MA	30	82
"	39	Kalamazoo C/MI	8	123
17	38	Carleton C/MN	13	108
"	38	LaSalle C/PA	47	67
19	36	Occidental C/CA	54	59
"	36	Rochester Inst. Tech/NY	71	49
21	35	Lebanon Valley C/PA	29	83
"	35	St. Thomas, C of/MN	18	96
23	33	Grinnell C/IA	20	95
24	32	Davidson C/NC	31	81
"	32	St. Josephs C/PA	44	68
"	32	Xavier U/OH	34	77
27	31	Dayton, U of/OH	53	61
"	31	St. Mary's C/MN	66	52
29	30	Bowdoin C/ME	42	69
"	30	Wabash C/IN	14	101
31	29	Calvin C/MI	20	95
"	29	John Carroll U/OH	83	46
"	29	Macalester C/MN	71	49
"	29	Reed C/OR	8	123
"	29	Williams C/MA	18	96
36	28	Fairleigh Dickinson U/NJ	107	37
"	28	Wheaton C/IL	35	76
38	27	Knox C/IL	36	74
"	27	Muhlenberg C/PA	57	58
40	26	Phil. C Pharm. [illegible]ci/PA	32	80
41	25	Earlham C/IN	71	49
"	25	Gettysburg C/PA	41	70
"	25	Siena C/NY	104	38
"	25	Swarthmore C/PA	16	100
45	24	DePaul U/IL	51	63
"	24	Loras C/IA	59	57
"	24	Loyola C/MD	59	57
"	24	St. John's U/MN	62	55
"	24	Trinity C/CT	42	69
"	24	Valparaiso U/IL	75	48

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51	23	Allegheny C/PA	27	84
"	23	King's C/PA	87	45
"	23	Marietta C/OH	62	55
"	23	Thiel C/PA	128	31
55	22	Bates C/ME	38	72
"	22	Bellarmine C/KY	120	33
"	22	Colorado C/CO	97	41
"	22	Ohio Wesleyan C/OH	28	84
"	22	Thomas More C/KY	134	29
"	22	Ursinus C/PA	54	59
61	21	Amherst C/MA	17	99
"	21	LeMoyne C/NY	134	29
"	21	Richmond, U of/VA	50	64
"	21	Rockhurst C/MO	120	33
"	21	Wittenberg U/OH	90	43
66	20	Augustana C/IL	36	74
"	20	Manchester C/IN	48	66
"	20	Mt. Holyoke C/MA	24	86
"	20	Ripon C/WI	107	37
70	19	Fairfield U/CT	160	26
"	19	Furman U/SC	93	42
"	19	Mississippi C/MS	59	57
"	19	Monmouth C/IL	24	86
"	19	Niagara U/NY	100	39
"	19	St. John Fisher C/NY	134	29
"	19	Scranton, U of/PA	71	49
77	18	Alfred U/NY	67	51
"	18	Augsburg C/MN	197	20
"	18	Hamline U/MN	67	51
"	18	Millsaps C/MS	107	37
"	18	St. Lawrence U/NY	90	43
"	18	Wake Forest U/NC	87	45
"	18	Washington & Lee U/VA	75	48
"	18	W. VA Wesleyan C/WVA	65	53
"	18	Wilkes C/PA	134	29
86	17	Albion C/MI	100	39
"	17	Bradley U/IL	57	58
"	17	Butler U/IN	93	42
"	17	David Lipscomb C/TN	171	25
"	17	Goshen C/IN	145	28
"	17	Hamilton C/NY	67	51
"	17	Haverford C/PA	20	95
"	17	Lawrence U/WI	48	66
"	17	San Francisco, U of/CA	116	35
"	17	Seattle U/WA	160	26
"	17	Wash. & Jeff. C/PA	83	46
97	16	Capital U/OH	100	39
"	16	Cornell C/IA	54	59
"	16	Elizabethtown C/PA	152	27
"	16	Il. Benedictine C/IL	176	24
"	16	Kenyon C/OH	75	48
"	16	Lewis U/IL	210	17
"	16	St. Michael's C/VT	134	29
104	15	Berea C/KY	90	43
"	15	Denison U/OH	75	48
"	15	Iona C/NY	160	26
"	15	Luther C/IA	120	33
"	15	Marist C/NY	210	17

Baccalaureate origins (con't)

104	15	Pacific Lutheran U/WA	193	21
"	15	Pomona C/CA	33	78
"	15	St. Anselm's C/NH	160	26
"	15	St. Norbert C/WI	197	20
"	15	Spring Hill C/AL	80	47
"	15	Westminster C/PA	113	36
115	14	Colgate U/NY	44	68
"	14	Drew U/NJ	83	46
"	14	Gannon C/PA	193	21
"	14	Morehouse C/GA	160	26
"	14	Rose Hulman Tech/IN	201	19
"	14	St. Bonaventure U/NY	125	32
"	14	St. Vincent C/PA	80	47
"	14	Washington C/MD	132	30
123	13	Centenary C/LA	100	39
"	13	Eastern Nazarene C/MA	171	25
"	13	Linfield C/OR	145	28
"	13	Loyola U/LA	83	46
"	13	Middlebury C/VT	44	68
"	13	Muskingum C/OH	87	45
"	13	St. Mary's U/TX	176	24
130	12	Antioch C/OH	38	72
"	12	Beloit C/WI	62	55
"	12	Birmingham-Southern C/AL	113	36
"	12	Dickinson C/PA	104	38
"	12	Gustavus Adolphus C/MN	152	27
"	12	Hobart & Wm.Smith C/NY	117	34
"	12	Merrimack C/MA	220	16
"	12	Pratt Institute/NY	-	13
"	12	Texas Lutheran C/TX	-	15
"	12	Wagner C/NY	145	28
140	11	Benedictine C/KS	176	24
"	11	Berry C/GA	183	23
"	11	Carthage C/WI	117	34
"	11	Colby C/ME	152	27
"	11	Norwich U/VT	201	19
"	11	Ouachita Baptist U/AR	186	22
"	11	Roosevelt U/IL	128	31
147	10	Amer. Int'l C/MA	208	18
"	10	Augustana C/SD	176	24
"	10	Bridgeport, U of/CT	-	10
"	10	Bridgewater C/VA	186	22
"	10	Creighton U/NE	117	34
"	10	Elmhurst C/IL	201	19
"	10	Emory & Henry C/VA	176	24
"	10	Geneva C/PA	107	37
"	10	Gonzaga U/WA	134	29
"	10	Hastings C/NE	134	29
"	10	Hiram C/OH	75	48
"	10	King C/TN	201	19
"	10	McMurray C/TX	220	16
"	10	Milliken U/IL	98	40
"	10	Monmouth C/NJ	-	11
"	10	Nebraska Wesleyan U/NE	160	26
"	10	Park C/MO	120	33
"	10	Puget Sound, U of/WA	160	26
"	10	Redlands, U of/CA	145	28

Baccalaureate origins (con't)

147	10	Southwestern at Memphis/TN	152	27
"	10	Wartburg C/IA	186	22
"	10	Western Maryland C/MD	197	20
"	10	Wheeling C/WVA	-	12
"	10	Whittier C/CA	125	32
171	9	Centre C of KY/KY	160	26
"	9	Concordia C-Moorhead/MN	193	21
"	9	Hanover C/IN	160	26
"	9	IL Wesleyan U/IL	113	36
"	9	Lake Forest C/IL	-	14
"	9	Loyola Marymount U/CA	201	19
"	9	Mt. Union C/OH	70	50
"	9	Mt. St. Mary's C/MD	210	17
"	9	Mundelein C/IL	-	12
"	9	North Central C/IL	160	26
"	9	Notre Dame C/OH	-	10
"	9	St. Francis C/NY	186	22
"	9	South, U of/TN	128	31
"	9	Stonehill C/MA	-	9
"	9	Wellesley C/MA	171	25
"	9	Whitman C/WA	120	33
"	9	Widener C/PA	-	14
"	9	Wofford C/SC	125	32
189	8	Albright C/PA	107	37
"	8	Aquinas C/MI	210	17
"	8	Bethany C/WVA	152	27
"	8	Carroll C/WI	134	29
"	8	Central U/IA	145	28
"	8	Florida Southern C/FLA	171	25
"	8	Maryville C/TN	152	27
"	8	Ohio Northern U/OH	132	30
"	8	Oklahoma City U/OK	-	13
"	8	Phil. C Tex & Sci/PA	-	12
"	8	St. Joseph's C/IN	210	17
"	8	Wheaton C/MA	-	12
"	8	Willamette U/OR	98	40
202	7	Bethany Nazarene C/OK	220	16
"	7	Bethel C/KS	-	15
"	7	Erskine C/SC	201	19
"	7	Hampton Inst./VA	-	11
"	7	Hendrix C/AR	176	24
"	7	Regis C/CO	128	31
"	7	Southwestern C/KS	134	29
"	7	Trinity U/TX	201	19
"	7	William Jewell C/MO	93	42

EXPLANATORY NOTES:

- The institutions on this list are all private colleges that offer principally undergraduate work in chemistry. None offer the doctorate on a regular basis although three colleges have authorization or collaborative arrangements to conduct doctoral work in chemistry. A number of the schools offer master's level work. All institutions are IIA or IIB category as determined by the AAUP.
- The data for this table was obtained from a list compiled by the Office of Institutional Research of Franklin & Marshall College from data provided by the Board on Human Resources, National Research Council on the baccalaureate origins of Ph.D. degrees granted in the United States each year since 1920.